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INDEX NUMBERS AND THE STANDARD OF VALUE.

I.

THE primary object of the index number is to measure or express variations in the value of money, and a little reflection will show that because of its object or end every index number involves some standard or unit of value. This standard of value may not be explicitly predicated, because on its face the index number is merely an objective, inductive investigation of prices. But when we reduce from these prices an expression of the change in the value of money, we have tacitly or explicitly set up the commodities—or a part of the commodities—to which these prices pertain, as a standard of value.

It is the belief of the writer that the index number and its peculiar problems can only be understood from the standpoint of the standard of value, and that, on the other hand, the discussion of the index number, which has now extended over more than a century, contains an important and a neglected contribution to the subject of the standard or unit of value. The object of the present paper is to supply a general theoretical introduction to the difficult and perplexing subject of index numbers

and at the same time to sum up the contribution of the statisticians to the old controversy of the standard or measure of value. I may add that in tracing the early history of the index number this object has been steadily kept in view: no attempt has been made either to describe each step or to mention the name of every contributor.

I. THE CONSUMPTION STANDARD.

It would be difficult to determine at just what point in the development of economic thought the great importance of devising some method of measuring variations in the value of money was first recognized, but as early as 1707, in any event, the subject had been brought to the attention of Bishop Fleetwood, in an extremely interesting problem in equity, and had elicited from him the familiar dictum that the value of money depends upon the necessaries and conveniences which it will buy. "For money is of no other use," he wrote, "than as it is the thing with which we purchase the necessaries and conveniences of life."[1]

We form our concept of a definite change in the value of money from observations of changes in single prices. If a bushel of wheat costs $1 this year, whereas last year its price was $2, we say that the purchasing power of money in wheat has risen 100 per cent. But the value of money comprehends its purchasing power in all directions, over all goods consumed by the individual or group of individuals in question. Consequently, we must include in the measurement all goods consumed by the group to whom the measurement refers. Before Bishop Fleetwood's time changes in the value of money had been usually calculated from the prices of corn alone. In the crude measurement which he made on page 136 of the *Chronicon Preciosum* there were included the prices of wheat, oats, beans, ale, cloth, and meat.

But it is apparent that another factor must also be taken into consideration. The principal motive which instigated the early

[1] *Chronicon Preciosum*, ed. 1745, p. 48.

measurements was the desire to ascertain how real wages were moving; how the wage-earner was affected by changes in the general purchasing power of money. From this standpoint it is evident that changes in the prices of some goods are far more important than similar changes in the prices of other goods. If the price of corn rose 50 per cent., it was of supreme importance to the wage-earner of the eighteenth century. But a rise in the price of pepper did not effect him materially. For like reasons a fall of 50 per cent. in the price of pepper would not offset a rise of 50 per cent. in the price of corn. Evidently some method must be found of estimating the relief occasioned by falling prices in terms of the hardship occasioned by rising prices. The relative importance of the various goods must be ascertained and used before a true net result can be reached.

The first writer to take these facts into account was Sir George Shuckburgh-Evelyn, the inventor of the index number.[1] His "Estimate of the Depreciation of Money Since the Year 1050" was appended, rather irrelevantly, to a paper on "Standards of Weight and Measure." The calculation was rough and incomplete—"slovenly" some one has termed it. Like Bishop Fleetwood before him, he took occasion to apologize for meddling with such vulgar business.

Shuckburgh included in his calculations the prices of day labor and fourteen commodities. The year 1550 was selected as the standard year or "datum line," and the general price level of that year was represented by 100. No prices in their ordinary forms were given. Each price current in the year 1550 was represented by 100, and all other prices were given in the form of ratios or percentages of 100. Thus, if wheat sold for two shillings a bushel in 1550 and for six shillings in 1650, the two prices would be represented by 100 and 300, respectively. These ratios will be spoken as *price-variations* in this paper. They have been called *percentages* and *index numbers*. But the term

[1] If it may be termed an invention. His measurement is to be found in the *Philosophical Transactions for 1798*, p. 309.

index number is most appropriately applied to the average of all the price variations.

An index number computed as in the preceding paragraph is known as a simple or unweighted index number. The various prices are taken into account on an equal footing. If wheat rises 50 per cent. and pepper falls 50 per cent. in price, the fall of pepper exactly counterbalances the rise of wheat. Fleetwood's calculation would have been of this nature had it been carried out. Shuckburgh's calculation took account of the greater weight or importance of some prices. Twelve of the prices, as is indicated in the punctuation of the footnote,[1] were grouped together and made equal to any one of the three other prices, so that the influence of either wheat, meat, or wages in determining the result was twelve times as great as the influence exerted by any one ofthe remaining articles.

Shuckburgh's paper was followed in the early years of the present century by several valuable works bearing upon real wages and the course of prices, from Tooke and Arthur Young.[2] The latter was probably the first economist to use family budgets in estimating the change in the value of money.[3] But for the present purposes the most important writer of the first quarter of the nineteenth century is Joseph Lowe, in whose volume, *The Present State of England in Regard to Agriculture, Trade, Finance, etc.*,[4] the idea of the tabular standard appears probably for the first time. The merit of Lowe's work lies not so much in the contribution of new ideas as in the clearness with which he invested the theory implicitly contained in Shuckburgh's method. Until Lowe's time the problem had been vaguely conceived as an attempt to measure the effect of independent price variations. The net change in a vague price level was to be

[1] Wheat; meat; day labor; horse, ox, cow, sheep, hog, cock, hen, goose, butter, chese (sic), ale, small beer.

[2] TOOKE, *High and Low Prices Since 1792*. YOUNG, *An Inquiry into the Progressive Value of Money in England.*

[3] YOUNG, *Inquiry into the Rise of Prices in Europe.*

[4] I quote from the American edition of 1824.

estimated by measuring the innumerable changes in the separate prices which composed it. Lowe rationalized the whole investigation by bringing it into direct connection with the theory of value. He attempted to show that the commodities consumed by any community, taken in the relative quantities in which they are consumed, may be assumed to represent the standard unit or measure of value. Given this consumption standard of invariable value, and our problem resolves itself into the simple task of finding the variations in its total cost. Thus, if V' represent the value of money in T', the first epoch of time, and V'' the value of money in T'', the second epoch,

$$\frac{V''}{V'} = \frac{\text{Total price of (constant consumption list in } T')}{\text{Total price of (constant consumption list in } T'')}.$$

Modified forms of the tabular or *consumption standard*, as it will hereafter be called, have been employed in the computation of index numbers by several statisticians of the present generation. The expression of the relation of these index numbers to the ideal consumption standard will be facilitated by the adoption of the following symbols:[1]

$c_1, c_2, c_3 \ldots c_n$ = commodities.
$p_1', p_2', p_3' \ldots p_n'$ = their respective prices in T'.
$p_1'', p_2'', p_3'' \ldots p_n''$ = their respective prices in T''.
$q_1', q_2', q_3' \ldots q_n'$ = the respective quantities consumed in T'.
$q_1'', q_2'', q_3'' \ldots q_n''$ = the respective quantities consumed in T''.

In this nomenclature, the simple unweighted index number will be represented as follows:

$$\frac{V''}{V'} = \left(\frac{p_1'}{p_1''} + \frac{p_2'}{p_2''} + \ldots \frac{p_n'}{p_n''}\right) \div n. \qquad (1)$$

In the symbols adopted above allowance has been made for the fact that the actual consumption of the various commodities varies irregularly from epoch to epoch. The consumption standard requires, however, that we assume a fixed commodity or

[1] $\frac{V''}{V'}$ will be used to represent the change in the value of money. Index numbers are usually, however, given in the form $\frac{V'}{V''}$ —"the change in the price level."

consumption list as standard; *e. g.*: $q_1 c_1 + q_2 c_2 \text{ - - - - } q_n c_n$. From which we have the *consumption index number*:

$$\frac{V''}{V'} = \frac{q_1 p_1' + q_2 p_2' \text{ - - - - } + q_n p_n'}{q_1 p_1'' + q_2 p_2'' \text{ - - - - } + q_n p_n''} . \qquad (2)$$

As we have no accurate statistics of consumption, (2) is usually computed from (1) in actual practice by weighting the price variations in rough accordance with their importance in consumption. It is evident, however, that in accordance with our assumption of a fixed consumption list, the exact weights would be the amounts expended upon the respective commodities in the second epoch, T''.

$$\frac{V''}{V'} = \frac{\frac{p_1'}{p_1''}(q_1 p_1'') + \frac{p_2'}{p_2''}(q_2 p_2'') \text{ - - - - } + \frac{p_n'}{p_n''}(q_n p_n'')}{q_1 p_1'' + q_2 p_2'' \text{ - - - - } + q_n p_n''} .$$

If we were computing the index number in its usual form, $\frac{V'}{V''}$, it is apparent that we should have to employ as weights the respective amounts expended in the first epoch.

The essential defect of the consumption standard is, of course, the fact that the consumption of society is not fixed. When the price of a commodity rises, we buy some substitute, and thus neutralize to a certain extent the hardship involved in the rise of price. When a commodity falls in price we use more of it, though under the new conditions and greater consumption we do not enjoy the commodity as much per unit, nor would we pay as much for it. We thus have two different standards of value: the consumption list of T' and that of T''. Both are wrong, and, in consequence, an average or mean of the two consumption lists is usually employed. As the quantities can be averaged in an infinite number of ways, there is no limit to the number of these average standards which may be suggested. Professor Edgeworth has collected a number of these compromises in his monograph published in the *Report of the British Association* for 1887 (page 265). I quote two of these for purposes of illustration, and add another — No. 5 — suggested by a

reading of Lehr's *Beiträge zur Statistik der Preise*. So far as I can see, it is neither better nor worse than the other members of this group.

$$\frac{V''}{V'}=\frac{1}{2}\left(\frac{q_1'p_1'\ -\ -\ -\ +q_n'p_n'}{q_1'p_1''\ -\ -\ -\ +q_n'p_n''}+\frac{q_1''p_1'\ -\ -\ -\ +q_n''p_n'}{q_1''p_1''\ -\ -\ -\ +q_n''p_n''}\right). \quad (3)$$

$$\frac{V''}{V'}=\frac{\frac{1}{2}(q_1'+q_1'')p_1'\ -\ -\ -\ -\ +\frac{1}{2}(q_n'+q_n'')p_n'}{\frac{1}{2}(q_1'+q_1'')p_1''\ -\ -\ -\ -\ +\frac{1}{2}(q_n'+q_n'')p_n''}. \quad (4)$$

$$\frac{V''}{V'}=\frac{\left(\frac{q_1'p_1'+q_1''p_1''}{p_1'+p_1''}\right)p_1'\ -\ -\ -\ -+\left(\frac{q_n'p_n'+q_n''p_n''}{p_n'+p_n''}\right)p_n'}{\left(\frac{q'p'+q''p_1''}{p_1'+p_1''}\right)p_1''\ -\ -\ -\ -+\left(\frac{q_n'p_n'+q_n''p_n''}{p_n'+p_n''}\right)p_n''}. \quad (5)$$

It is needless to say that, in addition to the theoretical difficulty just mentioned, the consumption index number is beset by many practical problems arising from the impossibility of securing accurate statistics of consumption or complete statistics of prices. The latter raises the grave question whether in the actual computation of index numbers it is better to include as many price variations as possible, or to restrict the calculation to the prices of very important articles. This question, which is as difficult as it is important, will be considered in a subsequent paper. The lack of accurate statistics of consumption makes it impossible to secure the weights which the consumption index number seems to require; but this difficulty, on the other hand, does not appear to be serious. A careful comparison of weighted and unweighted index numbers calculated from the same price variations shows that the difference is usually inappreciable in comparison with the general margin of error to which all such calculations are liable. Indeed, this result might be expected *a priori*. As we know of no connection between the price variation and the importance of a commodity —the prices which rise are as likely to pertain to important commodities as those which fall, and *vice versa*—it is to be expected that the weights given to price variations below the arithmetical mean will about offset those given to price

variations above that mean, and that the weighted average will be substantially the same as the arithmetical average.

But the change in the consumption list — the variation in the standard unit — is more than a difficulty; it is an essential defect that vitiates the whole consumption standard. A change in the *per capita* consumption of a commodity is, by all theories of value, the surest indication of a change in the value of the commodity, and, in consequence, a standard of value made up of commodities whose quantities are ceaselessly changing lacks all fixity of value and is, therefore, no standard. The familiar weighted index number is merely the old "tabular standard" in operation, and both when examined closely are found defective.

To the statement that a change in quantity consumed is practically always equivalent to change in value per unit, the "practical man" would probably reply that he cares nothing about this metaphysical species of value; that all he desires is to find the variation in the "purchasing power" of money over commodities in general, assuming that a commodity is a commodity and of fixed importance in both epochs and in whatever quantity consumed; that this is what the statistician, the statesman, and the student of currency is most concerned in doing.

And in this statement we should all heartily acquiesce if it were possible to measure, even approximately, the change in the purchasing power of money so defined. But it is not possible. If we take our "practical" friend literally, it follows that money has a purchasing power over the commodity c_1, another purchasing power over c_2, a different purchasing power over c_3, and so on. When the prices of these commodities vary in different directions and degrees, we have a number of incommensurable price variations which, by our definition of purchasing power, cannot be reduced to an average. John Stuart Mill, for instance, would probably have taken this stand if he had not based his conclusions in this matter upon a wholly impossible case: that where a dollar buys exactly twice as much of each commodity in one time or place, as in the other. In this case the consumption standard is, of course, feasible.

But the "practical" man is usually willing to admit that in this calculation certain commodities and prices are much more important than other commodities and prices, and he proceeds to construct weights in accordance with the importance of the several commodities in consumption. The essential fallacy involved in this procedure will best be shown, perhaps, by stating the complete problem in its lowest terms. In T' and T'', respectively, the community in question actually expends

$(q_1' p_1' \text{ - - } + q_n' p_n')$ dollars for the commodities $q_1' c_1 \text{ - - } + q_n' c_n$,
$(q_1'' p_1'' \text{ - - } + q_n'' p_n'')$ dollars for the commodities $q_1'' c_1 \text{ - - } + q_n'' c_n$.

The q's and p's being supposed to be known, we may designate by A' etc., the expressions $\left(\frac{q_1'}{q_1' p_1' \text{ - - - } q_n' p_n'}\right)$, etc., and write:

Purchasing power of the dollar in $T' = A_1' c_1 + A_2' c_2 \text{ - - - } + A_n' c_n$,
Purchasing power of the dollar in $T'' = A_1'' c_1 + A_2'' c_2 \text{ - - - } + A_n'' c_n$.

The index number which we desire is the ratio between the right-hand members of these equations.

But these members cannot be reduced to a simple numerical ratio as they stand, except, indeed, in the imaginary case in which $\frac{A_1'}{A_1''} = \frac{A_2'}{A_2''} = \frac{A_n'}{A_n''}$. They are composed of diverse and heterogeneous commodities which must be weighted in accordance with their importance—*i. e.*, expressed in terms of a common unit—before the index number can be secured. And the commodities have but a single attribute or quality in common—that of price or purchasing power, dependent upon their ability to satisfy human wants. Their importance is proportional, at any given time, to their prices.

But when we come to weight the commodities in accordance with their prices we encounter the essential difficulty which vitiates this method of measurement. Shall we take the price relations of T', or those of T'', or an average between the two? We can do none of these. The importance of the commodities is not proportional to their prices in T' or T'' because there is exactly the same reasons for using one set of price relations as the other, and yet they give different results. Both, then, are

necessarily wrong. But neither can we average these price relations, because they are expressed in terms of the monetary unit and *ex hypothesei* this unit varies between T' and T''. The reason why this essential defect of the weighted index number is not more clearly understood is probably to be found in the lack of accurate statistics of consumption. As it is a foregone conclusion that only the roughest approximations of the weights can be secured, nobody seems to have taken the trouble to inquire whether, theoretically, there was any definite mathematical quantity to approximate.

I have expressed the problem in this manner because this is the natural and logical way of attacking it. In the actual computation of index numbers, however, the practice is usually to ascertain the individual price variations and then weight them in accordance with the importance of the commodities in consumption. But this importance can be determined only from the expenditures for these commodities in actual consumption. And here again we meet the old difficulty. Shall we use the expenditures of T', those of T'', or an average between them? As in the preceding paragraph and for the same reasons, we cannot use any of these as weights.

For reasons similar to those given in the two preceding paragraphs, it is also impossible to average the consumption of the various commodities, as is done in the index numbers quoted on page 7. We cannot average the quantity of c_1 consumed in T' and T'' because for present purposes c_1 is not the same thing in T' as in T''. The purchasing power of money is determined by its command over a certain commodity list, composed of different quantities of different commodities. Each commodity, then, at any given time, represents or is a certain quantity of purchasing power. Now when we average the quantities q' and q'', of any commodity, we assume that the purchasing power of that commodity is the same in T' as in T'',—an impossible assumption, as the purchasing power of almost every commodity (and c_1 is any commodity) varies in any considerable interval of time, T'–T''.

There is, thus, nothing to be gained by abandoning "value" and confining ourselves to "purchasing power." The impression seems to have become general, not only among practical men, but among certain economists that metaphysical subtleties are to be avoided by dismissing the attempt to measure the change in what the Ricardians called the "real value" of money, and confining our efforts to the measurement of change in the purchasing power; or to be more practical and objective still, to the measurement of the "average variation in prices" or the "net change in the general level of prices." But as we have seen, not a single difficulty is avoided by this manipulation of words. The problem that worried Ricardo is before us still. As has been shown, there is—from the standpoint of the consumption standard at least—no average variation of prices, no net change in the general level of prices. If we pay $1,000 for twenty horses, we can usefully and intelligently say that their average price is $50. But we can no more average weights, as described above, than we can average one opera, ten strawberries, and twenty donkeys. This, I take it, is what Professor Marshall meant when he said: "A perfectly exact measure of purchasing power is not only unattainable, but even unthinkable."[1] Like Lewis Carroll's nonsense verses, the phrase "average variation of prices" sounds well, but means nothing.

II. THE LABOR OR PRODUCTION STANDARD.

One of the gravest and most obvious practical defects of the consumption standard is its inadequacy as a standard of deferred payments. If in T', A borrows $100 from B when both are making $1 a day, and prices are at a point represented by 100, how much should A repay in T'' when both are making $2 a day and prices are at a point represented by 95? A is as able to repay $200 as B was to loan $100, and yet according to the consumption standard B should return only $95. Imagine the reverse case, in which prices rise and wages fall, and it will be still more apparent that the consumption standard is wholly

[1] See *Third Report of the Royal Commission of Trade and Industry*, pp. 422, 423.

one-sided; fairly equitable from the standpoint of the consumer or creditor, but completely unsuited to voice or express the relative ability of the debtor or producer to repay.

An examination of pages 9 and 13 of the first volume of the Aldrich Report upon *Wholesale Prices, Wages, and Transportation* will reveal the fact that the illustration which has been used here is not a fanciful one, but based upon actual conditions as they existed at the beginning and end of the period covered by that report. During this period—measured by the consumption standard as closely as it can be applied in practice—prices fell a little while wages rose a great deal, yet the consumption standard constitutes an equitable standard of deferred payments only on the assumption that prices and wages vary in the same direction and, approximately at least, in the same ratio. It is interesting to note that the writer who first proposed the consumption or tabular standard—Lowe—understood clearly what many of his followers do not: that the consumption standard, if tenable, would apply only to a limited class.[1]

That this defect in the consumption standard should be noticed, and measures taken to devise a standard adapted to the needs and interests of producers as opposed to consumers, was inevitable. The consumers' standard came from a group of writers who were preëminently concerned with the welfare of the laborer as affected by the change in real wages, whose interests were humanitarian rather than scientific and whose standard was practical rather than theoretical; the principal commodities taken in the average quantities in which they were consumed furnished a standard sufficiently precise for their purposes. The production standard shows a similar hereditary bias. It proceeded from a body of theorists who endeavored to formulate the laws supposed to obtain in a well-simplified industrial world, and who consistently emphasized and claimed that the prosperity of the laborer depended upon the welfare of the producer. The

[1] See appendix to *Present State of England*, entitled: "How far are particular tables required for particular classes?" "A scale formed on the table in the text is adapted to very many persons in the middle and upper classes. . . . . But in regard to several of the classes currently termed productive, the question is different. . . . ."

result was the cost of production theory of value and the substitution of a single commodity—labor—for all commodities, as a standard of value.

It would hardly be profitable to thresh over the old classical controversy about the measure of real value, or to point out the delicate differences between those who accepted some form of the labor standard. As formulated by Adam Smith, the labor standard is purely subjective: a standard of disutility based upon the assumption that if there are no great variations in the time and painfulness of labor, the labor may be regarded as constant in value.[1] Unfortunately, in some respects, Smith also formulated the doctrine that in primitive society commodities will exchange in proportion to the respective amounts of labor expended in their production. From this theory it is easy, though illogical, to conclude that the value of labor is invariable at all times. As has so often been pointed out, this fact seems to have been understood by Smith. He was quite willing that his labor standard should derive whatever support it could from the more general cost of production theory, but he did not base the labor standard upon the latter theory. He went boldly over to a subjective basis and affirmed that a fixed amount of labor sacrifice is equivalent to or *is* a constant amount of value. Labor is the standard not because the ratio of exchange between two commodities tends to be the same as the ratio between the respective amounts of labor necessary to produce them, but because the value of a fixed quantity of labor is also fixed. With this postulate there is no necessity for the cost of production theory.

The classical economists, however, interpreted the labor standard in the light of the cost of production theory of value, and the inevitable result of this interpretation was its successive modification and final rejection by the best minds of the first half of the nineteenth century. Smith's dictum, "Equal quantities of labour, at all times and places, may be said to be of equal value to the labourer," entails the obvious consequence that the real

[1] *Wealth of Nations*, book i. chap. v.

wages of the laborer are of invariable value. This was so contradictory of history and everyday experience that Ricardo had no trouble in securing a general acceptance of his emendation that it was not the labor for which a commodity would exchange, but the labor incorporated or realized in it, that measured its value.[1] Then it became apparent that as in modern society goods are produced by the co-operation of labor and capital, the latter must in some way be linked with labor in the standard of value. Next it was recognized, dimly at least, that the cost of production theory of value is a theory of the causes which would regulate exchange value in an artificially simplified industrial world, and that what was required in a standard of value was a constancy in the forces or causes which regulate its value. This necessitated the further modification that the ideal standard was one of labor sacrifice and the abstinence involved in saving, and a doubt naturally arose as to the commensurability of the component parts of the standard and was argued at great length by Malthus in his *Measure of Value Stated and Illustrated*. Finally, there appeared, in germ at least, Professor Marshall's thesis that, as contemplated by the cost of production theory, labor is itself a product of labor, and that to estimate the labor incorporated in any commodity we would have to summate an indefinite series, about the early terms of which we can know nothing. By this time the discussion had reached a depth of speculative obscurity which almost justifies the contempt which the younger Mill evidently felt for it all.[2] His feeling was probably intensified by the admission of such men as Ricardo and Cournot that while we can imagine an invariable standard and "hypothetically argue and speak about it" as if we possessed it, the standard itself is unattainable.[3]

The labor standard possesses a certain plausible importance

[1] Also stated by Lord Lauderdale in his *Inquiry into the Nature and Origin of Public Wealth*, p. 26 *et seq.*

[2] *Principles of Political Economy*, book iii. chap. xv.

[3] RICARDO, *Principles*, chap. xx; and *Letters of Ricardo to McCulloch*, edited by Hollander, p. 154 *et seq.* COURNOT, *The Mathematical Principles of Wealth*, chaps. i and ii.

as a standard of deferred payments and it has been indorsed for this and other purposes by many prominent economists, including, it would seem, Professor Marshall.[1] As a standard of value it has peculiar and fatal deficiencies, but in its development and theoretical weaknesses it is essentially akin to the consumption standard.

Representing wages or the prices of the different kinds of labor by w_1', w_2', w_n', in T', and by w_1'', w_2'', w_n'', in T'', we have according to Adam the *unweighted labor index number*

$$\frac{V''}{V'} = \left(\frac{w_1'}{w_1''} + \frac{w_2'}{w_2''} \text{ - - - - } + \frac{w_n'}{w_n''}\right) \div n. \qquad (6)$$

This is evidently similar to the simple arithmetical index number of prices marked (1), and has the same defect; it takes no account of the relative importance of the various kinds of labor. The difficulty may be treated as the similar difficulty was treated in the case of the consumption index number. If we regard society as a huge individual expending the same amounts of labor each year, we will have a standard labor list the various elements of which remain constant. Thus, representing quantities of labor by q_1, q_2, q_3, q_n, etc., we have

$$\frac{V''}{V'} = \frac{q_1 w_1' + q_2 w_2' \text{ - - - - } + q_n w_n'}{q_1 w_1'' + q_2 w_2'' \text{ - - - - } + q_n w_n''}.$$

This may be called the *weighted labor index number*. It may be obtained from the unweighted number by weighting the latter with the respective amounts expended upon the several kinds of labor in the second epoch. As in the consumption index number, q_1, q_2, - - - q_n represent some mean or average of the respective quantities $(q_1' + q_1'')$, $(q_2' + q_2'')$ - - - $(q_n' + q_n'')$.

Mr. Bowley has used a composite labor list, made up of the various kinds of labor in the proportions in which they are on

[1] "When it (appreciation of gold) is so contrasted, and used in denoting a rise in the real value of gold, I then regard it as measured by the *increase* in the power which gold has of purchasing labour of all kinds — that is, not only manual labor, but the labour of business men and all others engaged in industry of any kind." *Final Report of the Gold and Silver Commission*, Appendix 1, p. 1. (The word "increase" italicized in the above is by mistake printed "diminution" in the Report.)

the average actually expended, in order to measure the average variation of wages.[1] Its use for this purpose need not be discussed here.

But as a standard of value it is evidently open to all the objections cited against the consumption standard and the index numbers based upon that standard. If we attempt to weight the independent wage variations according to the average expenditure upon the several kinds of labor in T' and T'', we are confronted by the old difficulty that these expenditures are expressed in different units and hence cannot be averaged. For the same reason we cannot average the quantities of any particular kind of labor expended in T′ and T″: the quantity and productivity of the labor having changed, its value has not remained constant. Labor is like any other commodity in respect to the fact that its value is a function of its quantity. In the third place the general theory upon which this standard is based entails the conclusion that the real wages of any particular class of laborers are invariable in value. Either this is untrue, or the kind of "value" of which it is true does not concern us. If a day's labor procured x commodities in 1860 and $x+y$ commodities in 1890, it is idle to say that the value of x is equal to the value of $x+y$. If it procured x in 1860 and nx in 1890, we are quite willing to admit that its value in 1890 may not have been precisely n times as great as it was in 1860, but under no tenable theory of value can it be exactly the same in 1890 as in 1860.

There is one other important theoretical defect in the weighted labor standard: as constituted, a variation of x per cent. in the wages of a high-grade laborer has more influence in determining the result than a variation of x per cent. in the wages of a low-grade laborer. As the foundation of this standard is labor sacrifice, this should not be the case. The variation in the wage of the sweat-shop worker toiling sixteen hours a day for a bare living is not less important than the variation in the wage of a trust company's president who receives a salary of $100 a day for his business sagacity. If, for instance, we are to use this

[1] See *Economic Journal*, vol. vi. p. 372 *et seq.*

standard as a standard of deferred payments, there seems no reason why one kind of wages should be given a greater *per capita* share in influencing the result than any other kind. Smith, Ricardo, and Malthus avoided all the mathematical difficulties of the labor standard by assuming that there were different qualities or grades of labor, and that the variation in wages would be substantially the same in all grades. This is exactly similar to the assumption upon which the consumption standard is based. It is not only untrue, but it is inadmissible as a working hypothesis because its use necessitates further violations of mathematical accuracy.

It is now generally admitted that the labor standard is a standard of cost of production, and this fact explains why it has been defended by so many writers as a standard of deferred payments: they desire to see debts adjusted, if they are adjusted at all, in accordance with the change in the general power of the community to earn money. For this purpose, however, our index number should be one of income rather than of wages, and might be represented by the formula

$$\left(\frac{I_1'}{I_1''}+\frac{I_2'}{I_2''} \text{ - - - - } +\frac{I_n'}{I_n''}\right)\div n. \qquad (8)$$

where I_1, I_2, - - - - I_n represent the incomes of different individuals. A similar, but theoretically more objectionable, formula has been proposed by Professor Newcomb,[1] who suggests that debts be adjusted in accordance with the movement of the national income, thus:

$$\frac{I_1'+I_2' \text{ - - - - } +I_n'}{I_1''+I_2'' \text{ - - - - } +I_n''}. \qquad (9)$$

This seems more objectionable than (8) because it attaches a greater importance to the variation of large incomes than that of small incomes.

If we assume that expenditure is equal to income in T' and T'', or bears the same proportion to income in T' and T'', (9) is equivalent to

$$\frac{q_1' p_1'+q_2' p_2' \text{ - - - - } +q_n' p_n'}{q_1'' p_1''+q_2'' p_2'' \text{ - - - - } +q_n'' p_n''}. \qquad (10)$$

[1] *Principles of Political Economy*, p. 210.

This formula has been suggested by Professor Edgeworth, not —it is significant to note—as an expression of the change in the value of money, but as "a standard for deferred payments—calculated to afford to the consumer a value-in-use varying with the national affluence, after the manner of a sliding scale."[1]

But in reality the labor standard and its modifications are not suited to serve even as standards of deferred payments, because they are adjusted wholly to the interests of the productive classes, and a large and important part of the creditor class is not productive. As Professor Böhm-Bawerk[2] has so clearly pointed out, the ultimate standard of value, and *a fortiori* the ultimate standard of deferred payments, must sum up in itself the merits of both the consumption and the labor standards. It must rest secure upon its own foundation, but it must effect, at the same time, a rational compromise between the two others.

The real service of the economists who discussed the labor standard in the early part of the last century—to catch up the historical thread again—was the differentiation of *real value* from *relative* or *exchange value*. Relative value, as they used the term, meant ratio of exchange, and from this standpoint money has as many exchange values as there are goods for which it will exchange. As shown in the preceding section, it is impossible to measure the net variation in ratios of exchange except where the variation has been the same in each ratio.

In reality, when the price of a commodity changes, nothing definite can be inferred concerning the change in the value of money. The measure and the measured are both exposed to the forces which make things cheap and dear. In consideration of this fact real value was distinguished from relative value. If one unit of gold exchanged for x units of bread, a logical explanation was found in the theory that one unit of gold contained x times as many units of real or generic value as did one

[1] *Report of the British Association*, 1887, pp. 271, 272.

[2] *Annals of the American Academy*, vol. v. part i. p. 208.

unit of bread. The moment we assert that two dissimilar and materially incommensurable commodities possess the same value, we postulate the existence of some measurable quality or attribute common to both.

To the query, what is the common quality of all valuable goods? Adam Smith answered that it was the labor sacrifice or disutility for which it would exchange. Ricardo answered that it was the labor sacrifice worked up or realized in it. At present it is clearly understood that sacrifice is not value, disutility not utility, and that there is no necessary or fixed connection between the two. The proper answer to the query was given as early as 1833 by W. F. Lloyd, D.D., who filled the Drummond chair of political economy at Christ Church, Oxford, from 1832 until 1837.

Lloyd pointed out very clearly what has since been explained so minutely by Jevons, Böhm-Bawerk, and others, that the value of a commodity depends upon the marginal intensity of the want it satisfies; that want is satiable, and that, in consequence, value depends largely upon the quantity of the commodity consumed. In his "Lecture on the Notion of Value as Distinguishable, not only from Utility, but also from Value in Exchange," Lloyd explains the gradual satiability of any want, and says: "It is on want thus estimated that value depends. . . . . The gratification derivable from the use of an object must be taken to be equal to the want of it, thus estimated; and the value, properly speaking, is the feeling of affection or esteem for the object, arising from a sense of the loss of the gratification contingent on the loss of the object. . . . . In its ultimate sense, then, the term undoubtedly signifies a feeling of the mind, which shows itself always at the margin of separation between the satisfied and unsatisfied wants. . . . . As I have explained the idea, it (value) consists in the real importance of an object to the person who possesses it." These words sound very familiar to readers of Böhm-Bawerk and others of the Austrian school. They have been taken from a volume of lectures by Lloyd published at Oxford in 1837.

III. THE MODERN INDEX NUMBER.

As in the case of the consumption and labor standards, the modern index number was a product of peculiar economic conditions existing at the time of its appearance. In the early years of the present century the principal concern of practical economic thinkers was about the wage-earner and the condition of the poor. With the passage of the reform acts and the repeal of the corn laws the predominance of interest passed to another problem. Following the report of the Bullion Commission and the resumption of specie payments by the Bank of England, a deep interest in the quantity theory of money had been aroused, which was only intensified by the passage of the Bank Act of 1844. For many years thereafter measurements of variations in the value of money were made chiefly for the purpose of testing the quantity theory of money, and this new *motif* showed itself in the methods of investigating changes in the value of money which were employed.

If the only (or the chief) cause of the variation of prices is a sudden and marked change in the quantity of money in circulation, we might expect to see all prices vary alike both in amount and direction. In the dispute between the adherents of the currency principle, and in investigating the effects of the influx of Californian and Australian gold, it became necessary to discover the cause of variations in prices. If the cause was on the money side it might be expected to show itself, as noted, in a certain uniformity of variation. If the separate price-variations were completely sporadic, however, a strong presumption was raised against the cause of variation having proceeded from the money side. In either event, the collection of price-percentages having been made, it was convenient for purposes of expression and illustration, to add them, take an arithmetic mean, and call the result the net variation in the general level of prices. The vital phenomena were the separate price variations. Any combination of these as a quantitative expression of the average amount of change was incidental. The index number appeared as a by-product.

Most of the investigations into the course of prices at this time were thus examinations into causes rather than measurements of actual changes. Porter introduces his index number in a discussion of the question, "whether under the régime of a circulating medium convertible at pleasure into gold, any issue of paper can be made and kept out to an excess that will tend to raise the general prices of goods."[1] Newmarch in his original investigation even neglected to compute a total index number.[2] Jevons himself was as much interested in proving a casual relation between money and rising prices as in measuring correctly the amount of the rise. The chief concern being with the individual price variations, there was no pressing reason to obtain the weights necessary to make the simple index number conform to the consumer's index number. The great object was to prove a uniformity in the price variations, and it is plain where this uniformity exists weighting is unnecessary. There was, thus, a return to the unweighted index number. By most writers of the time the latter was regarded as a mere approximation of the weighted average. But Jevons placed it upon a new and independent basis.

If Evelyn was the inventor of the index number, Jevons was its popularizer. The large amount of literature which has appeared on this subject, particularly in Germany and England, was mainly inspired by Jevons's pamplet entitled *A Serious Fall in the Value of Gold Ascertained*, etc.[3] Together with a great talent for the exposition of abstruse subjects, Jevons possessed in an unusual degree the faculty of feeling and communicating a decent respect for the importance of any subject upon which he wrote. He made of this essay one of the most remarkable chapters in economic literature.

The explanation of this fact is to be found in the contradictory character of the essay. It was a peculiar mixture of truth and error. Jevons began by taking sides with Lowe and

[1] PORTER, *Progress of the Nation*, p. 425.

[2] NEWMARCH, *Journal of the Statistical Society*, 1859, p. 96 *et seq.*

[3] See *Investigations in Currency and Finance*, p. 14 *et seq.*

the consumption standard. Value, he asserted, "is a vague expression for potency in purchasing other commodities, and if gold has become less potent with respect to some and not less potent with respect to others, it has fallen in value."[1] But although he gave a formal assent to the consumption standard, he made no attempt at weighting the simple index number in order to make it conform to the consumers' index number. "Ought we to take all commodities on an equal footing?" he asks. "Ought we to give most weight to those which are least intrinsically variable in value? Ought we to give additional weight to articles according to their importance, and the total quantities bought and sold? The question, when fully opened, seems to be one that no writer has attempted to decide—nor can I attempt to decide it. I regard the fall of value as conclusively proved, although the exact nature of the problem is left amid the obscurities of economic science in general."[2]

Jevons gave no categorical answer to his query about weighting. But the device was omitted and there is no doubt that this omission was a deliberate answer to the problem which he had stated. But, unfortunately, he did not or could not explain his action. He accepted the consumption standard, which requires weighting and the arithmetic mean, and then computed an unweighted number with the geometric mean. Had he explained his introduction of the geometric mean his essay would probably have escaped the searching criticisms of Forsell, Laspeyres, Drobisch, and others. But the arguments which he used to defend his course were riddles rather than reasons. It is these riddles which have most effectively contributed to the study and discussion of the proper method of computing index numbers.

Long after the publication of Jevons's pamphlet these riddles were successfully answered by Professor Edgeworth, who showed the usefulness of Jevons's method by interpreting it in the light of the theory of probability and the statistical studies of Quetelet. Jevons's method, as has been just said, differs from the

[1] *Investigations in Currency and Finance*, p. 20. [2] *Ibid.*, p. 21.

ordinary consumption index number by the absence of weighting and the use of some other than the arithmetic average. But the important difference really lies in the different interpretations put upon the price variations in the two methods. This difference will best be shown, perhaps, by an illustration.

Suppose that we had to ascertain the weight of a very large and heavy mass by means of a balance which was difficult to operate and known to be erratic and inaccurate. Two methods of procedure might be followed. We might divide the mass into a large number of particles, weigh these, and obtain our answer by adding the weights of the several particles arithmetically. This method would be somewhat analogous to the consumption index number. On the other hand, if the error of the scale was not known to be of a specific kind, we might weigh the whole mass a large number of times and take as our answer the average of the several readings of the scale. In the latter case each reading would be an independent answer in itself, no weights would be employed, and the geometrical mean, in accordance with previous experience in such work and with certain accepted scientific principles, would be preferable to the arithmetic mean. The latter operation is more closely analogous to the index number of Jevons and indicates clearly the different rôle of the price variations in the two methods. To Jevons each price variation was an independent and, before the average was computed, an equally valid answer to the question: What has been the change in the value of money? In the consumer's index number, however, each price variation is supposed to affect the value of money differently and the final answer must be obtained by summating the several variations after they have been weighted in accordance with their importance.

Professor Edgeworth has on several occasions shown very clearly the theoretical superiority of the geometric over the arithmetic mean, for the purpose of averaging price variations.[1] The question is really one of "better or worse," however, not one of "right or wrong," and it need not concern us here.

[1] See EDGEWORTH in the *Economic Journal* for March 1896, p. 137.

Practical experience with index numbers computed from the same data by different means shows that the differences are usually inappreciable in comparison with the possible errors introduced by defects in the statistical data. Jevons's method may thus be considered as the simple unweighted average of price variations, in a new interpretation.

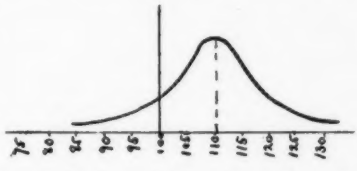
The unweighted index number is justified in several interpretations of the problem under consideration. In the first place we may take the case of those economists who refuse to admit that money has a general or homogeneous value.[1] In their view, money has one value in c_1 another value in c_2, another in c_n etc., and these values are heterogeneous. If prices vary differently the "values" of money have varied differently, and strictly speaking that is all that can be said: each price variation stands by itself as an independent and complete measure of one change in the value of money. Any combination of these percentages is meaningless, but a fictitious average or type may be secured which will serve to facilitate discussion, where quantitative accuracy is not demanded, by saving words. It is merely "a compendious way of stating facts, the full expression of which would be tedious and inconvenient."

The case in which the unweighted average is most clearly applicable is that in which a sudden emission of paper money or some other cause affecting confidence in the currency has produced a general and widespread variation of prices. Owing to the nature of this cause, the variations in prices would tend to be the same, and speaking absolutely the change in the price of a single commodity would show the change in the value of money. Practically, however, if the interval of measurement $T'-T''$ were not exceedingly short, we should be forced to take an average of a large number of price variations in order to eliminate or destroy the effect of accidental deviations from the mean type. And in this case we should use the average not as a mere dialectical device for saving words, and not as an end in itself, but as an instrument to elicit and express that variation

[1] *Cf.* WALKER, *Money in its Relation to Trade and Industry*, p. 30 *et seq.*

which occurred with the greatest frequency — the variation caused by the influx of new money. Moreover, if a great and preponderant majority of the price variations were of the same amount, while the deviations from this common variation were equally distributed above and below it, we should admit that "the most frequent variation" expressed, by inversion, not only the change in the value of money due to the specific cause assumed, but the net change in the value of money resulting from all causes.

Professor Edgeworth, in a series of brilliant contributions, has made this field of inquiry all his own[1]. The *quaesitum* of the process now under consideration may be described in his words: "This type of mean variation may be generally defined as that figure which would be presented most frequently if we were to continue indefinitely the long series of price ratios, or at least that return in whose neighborhood the greatest number of these statistics cluster. It is, in other words, the Greatest Ordinate of the complete curve, or the highest column of the rectilinear diagram which represents by its abscissa ratio between the prices of two compared epochs and by its ordinate the frequency with which that ratio would be returned if the statistics were extended over every region of industry which is subject to independent fluctations." Such a type is exhibited in the subjoined curve, where abscissae represent the different price variations and the ordinates represent (or vary with) the number of times the corresponding price variation occurs. If the price variation when plotted arranged themselves as shown below, we might confidently announce 110 as the index number of prices desired.



Accepting the maximum ordinate as the *quaesitum* of this method, it becomes necessary to inquire into the validity of the method and the meaning of the result in a more complicated case, that in which the origin

[1] See *Reports of the British Association*, 1887, p. 281 *et seq.*; 1889, p. 156 *et seq.*; and *Journal of the Royal Statistical Society*, June 1888.

of the variation in prices is obscure and the interval $T' - T''$ long enough to permit the operation of all those industrial forces such as invention, combination, discovery of new sources or restriction of old sources of raw material, which cause variations in the prices of commodities. This is the case with which we actually have to deal.

Here again the validity of Jevons's method to elicit and express the change in the value of money proceeding from the money side might be defended on the grounds that price variations proceed from changes in the quantity of money in circulation and from changes in the conditions of production — "changes from the side of money" and "changes from the side of commodities"— that the change from the money side would be a uniform change, those from the side of commodities sporadic and irregular; and that the maximum ordinate — or the mean of the price variations best calculated to represent the maximum ordinate — would be an accurate expression of the change in the value of money arising from changes in the quantity of money in circulation.

If this theory be tenable, the result is so circumscribed as to be of little value. Index numbers are not computed with the idea of determining that part of the change in the value of money which has proceeded from a given cause. What we desire is the net change in the value of money. The ideal of the consumption standard is correct enough.

But the theory is not tenable: it errs by reason of excessive simplicity. Ordinarily changes in the quantity of money do not affect prices uniformly and would not affect them uniformly if invention, combination, and all the other industrial forces which affect prices were inoperative. A large influx of metallic money, for instance, affects prices not so much by depressing the general desire for or estimation of money as by entering subtly into the veins of trade, stimulating production, and supporting a large number of enterprises which otherwise would have foundered. In a large number of industries it intensifies the law of increasing returns and *pro tanto* operates to diminish

prices. In a smaller, but very important, number of industries it intensifies the operation of the law of decreasing returns and *pro tanto* operates to increase prices. Under ordinary circumstances, therefore, it seems impossible to use Jevons's method, as I believe he thought it could be used, to measure the variation in the value of money due to the change in the volume of money.

The immediately preceding paragraphs will suggest the answer to the two queries with which we are at present concerned. Whether this process be at all applicable, and whether, if applicable, it yield as a result the net variation in the value of money or something else, depends upon the symmetry of the curve of price variations. In order that the maximum ordinate should represent the net variation in the value of money, the curve would have to be exactly symmetrical; the price variations below the variation of greatest frequency would have to be exactly equal in number and importance (or in both combined) to the price variations above it. No one who has given a moment's thought to the nature and cause of price variations in ordinary periods would have the slightest expectation of finding this symmetry in a curve of price variations, and, as a matter of fact, we do not find it, or anything like it. The operation of the two great laws of increasing and decreasing returns, and the fact that prices may (theoretically) rise indefinitely while they cannot fall more than 100 per cent., are practically sufficient in themselves to destroy the possibility of a symmetrical distribution of the price variations. The unweighted index number, then, furnishes neither the net variation in the value of money nor the variation arising from the money side. What it does furnish is a broad general type of price variations, the usefulness of which is very much less than that of the net variation and something more than that of the fictitious average described on page 24.

But, as stated above, not only the meaning of the result but the general applicability of the process depend upon the symmetry of the curve of price variations. It is not sufficient that one (set of) price variation(s) should be in a majority; it must

be in a large majority, and as more and more prices are included within the scope of the investigation the curve must become smoother as it recedes from the apex, and the slope of the curve steeper: "it is a characteristic of the things with which probability is concerned to present, in the long run, a continually intensifying uniformity."[1]

Just what degree of symmetry in the curve of price variations is necessary to justify the employment of this process is a question which the writer is not competent to treat. The following reasons are given, however, for the doubt that is in him concerning the suitability of this process to elicit even a mean type of price variations with the requisite qualifications.

1. Changes in the volume of money can be expected to produce a general or uniform variation in prices only when the currency is an inconvertible paper currency and the interval of measurement very short. This is a case which seldom occurs.

2. There are constantly at work two great sets of causes, in addition to the one mentioned above, which tend to influence prices in different directions. The first, consisting of competition, invention, increase of capital, betterment of methods and all the causes known loosely as industrial improvement, operate to reduce prices. The second, including industrial combination, possibly, exhaustion of sources of supply, increase of indirect taxation, and pressure of population where the source of supply is fixed, *e. g.*, urban land, operate to increase prices. Thus, whatever the nature of the influence exerted by changes in the supply of money, it must be assisted by one set of important forces and resisted by another. As a consequence — and this is particularly true where the causes from the money side are operating to increase prices — we are not unlikely to get a curve with a double apex, showing two general types of price variations, the one only a little less "mean" than the other.

3. This possibility is indicated in the following table showing the frequency of the various price variations in each of the

[1] VENN, *Logic of Chance*, third edition, p. 455.

thirteen years, 1879–1891. The price variations or ratios, which are given as percentages of the respective prices in 1860, were counted in blocks of ten — a variation of 81, for instance, having been counted with one of 88 as a member of the group 80–90. The table is based upon returns given in the *Aldrich Report on Wholesale Wages, Prices, and Transportation*, Vol. I, pp. 30–52, the price variations being taken as they are there given, except that the twenty-seven varieties of pocketknives distinguished in the *Report* have been grouped and treated as a single commodity. The period, 1879–1891, was selected simply because it is the only period subsequent to 1860, and covered by the *Aldrich Report*, in which the currency of the United States was on a metallic basis.

The significance of these data will most readily be seen by plotting the corresponding curves. However, from the figures themselves it is apparent that in the five of the thirteen years— 1879, 1880, 1882, 1885, 1886—there were subordinate movements sharply distinguished from the main movement of prices, yielding, when plotted, curves with two or more apices. The process of grouping employed here is itself equivalent to a large degree of "smoothing," and I see no reason to believe that in any year the completed set of price returns would yield a smoother or more symmetrical curve than the one given by the prices treated—nearly 200 in each year. The point has been made by Dr. Venn and Professor Edgeworth—and it seems well taken—that some average of the representative list of price variations is likely to approach the maximum ordinate of the complete set of price variations more closely than the maximum ordinate of the representative list. But this does not mitigate the necessity of basing our inferences about the general contour of the ultimate or complete curve of price variations upon the incomplete curve which we have.

To sum up the results of this and preceding sections, we may say that there is not only some doubt as to the adaptability of price statistics to this method of treatment, but the irregularity and assymetry of the curve of price variations make it

TABLE SHOWING THE FREQUENCY OF THE VARIOUS PRICE VARIATIONS FOR THE YEARS 1879-1891, INCLUSIVE.

	0 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	100 per cent.	110 per cent.	120 per cent.	130 per cent.	140 per cent.	150 per cent.	160 per cent.	170 per cent.	180 per cent.	190 per cent.	200 per cent.	500 per cent.
1879	0	1	3	1	9	22	18	47	16	25	18	14	7	4	5	2	0	0	1	4	
1880	0	1	2	2	2	7	14	30	22	37	25	22	7	3	5	2	5	0	1	5	
1881	0	1	1	2	6	6	18	22	37	30	22	16	11	4	1	6	3	2	1	6	
1882	0	1	1	2	5	11	8	25	21	41	23	14	7	2	7	4	4	1	4	7	
1883	0	2	0	3	3	13	18	18	33	30	22	15	5	2	4	5	3	4	2	7	
1884	0	2	0	4	10	17	21	29	34	21	19	14	4	4	3	6	6	1	0	5	
1885	1	1	2	6	15	21	26	25	32	18	13	11	5	4	3	4	3	1	0	4	
1886	1	1	3	4	13	19	32	33	22	23	9	8	4	4	2	6	0	2	0	1	
1887	1	1	2	9	15	21	36	25	22	17	7	12	6	2	3	3	6	2	1	5	
1888	1	1	2	10	9	16	36	26	22	20	15	16	11	1	3	3	1	4	0	6	
1889	1	1	4	7	13	24	27	35	13	18	13	11	5	7	2	3	4	1	2	5	
1890	1	1	4	8	16	21	30	27	17	18	11	9	7	4	7	2	2	2	0	6	
1891	1	4	5	7	16	17	30	26	23	19	13	11	7	4	4	4	2	1	0	5	

extremely improbable that the mean variation will in any particular case be a close approximation of the net variation. As a matter of fact, however, there is no "net variation," as this term is generally understood. The reasons for this have been previously given in the treatment of the consumption standard, and they amount essentially to the important fact that we cannot treat goods which are consumed in different quantities as of invariable value. The attempt to do it is not only contrary to all recognized theories of value, but as a simple proposition of statistics it results in producing a number of formulæ or index numbers which are different, yet nevertheless have equally valid claims for selection. It might almost be laid down as a general proposition of logic where such a condition results from a course of deduction in the successive links of which no error can be discerned, that a mistake has been made in the original premises.

The foregoing constitutes what might be called the ultra theoretical case against the ordinary index number. In addition, however, the standards which treat ordinary commodities and labor as invariable in value, irrespective of the quantity in which they are consumed or purchased, are beset by the important practical difficulty that they represent the interests of a

limited class, either those of the consumers or those of the producers—and these classes do not coincide. There is a practical as well as a strong theoretical and historical necessity for some standard of deferred payments logically intermediate between the consumption and labor standards.

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IRON AND STEEL IN ENGLAND AND AMERICA.

THE commercial, nay, the economic and political status of Great Britain, and the economic status of its working classes, is so entirely dependent on her manufactures, and the primary materials coal and iron, that the nervousness felt by its statesmen and people when anything arises on the horizon threatening the continuance of its dominating position, seems excusable.

Hundreds of millions of people could live in ease and comfort in America from the products of its soil. If all other nations should close their doors against us we could well maintain ourselves from our own resources. England's people would be exposed to starvation if by any contingency they were deprived of foreign food supplies, as she does not grow sufficient food to feed more than two-thirds of her present population. She can only pay for the constantly increasing foreign supplies by the labor of her industrial population. For this reason declining trade is an issue of much greater moment to her than such a contingency would be for us.

But were this her real condition we should be the last people to rejoice. It would affect the most responsive market we have for our surplus supplies of food stuffs, not to speak of other products, for which England is our best market. England's industrial position is therefore one worthy of careful study by Americans.

Let us see for a moment whether present conditions justify the serious apprehensions we see exhibited. England still holds undisputed sway in cotton manufacturing. Germany has made no material progress as an exporter of cotton fabrics in the last fifteen years. In 1882 exports in cotton textiles amounted to sixty-seven million marks ($16,000,000); in 1897 they were seventy millions ($16,700,000), and in 1900, a so-called boom year, ninety millions ($21,420,000). America can only be

considered as a competitor in the coarser yarn numbers. Wherever finer counts are in demand, and this is the case in most of the cotton using countries, we have made little impression on the market.

India cannot prevent the products of British looms coming in undiminished quantities to her own shores. As a matter of fact one third of all the English exports of cotton fabrics go to India. Indian (Surat) cotton is not suitable for yarns finer than No. 24, and the chief trade of the world is in higher numbers. It is evident therefore that no menace to England's trade from that center is to be counted a possibility.

The Indian exports of cotton manufactures and yarns in 1899 amounted to ninety million rupees ($29,000,000). The raw material of these manufactures grows at no appreciable distance from the factory. On the other hand, England shipped in the same year to India and eastern Asia £26,500,000 ($129,000,000) in cotton yarns and manufactures, the raw material of which is carried several thousand miles to reach the factory.

American exports of cotton goods to China, India, Japan, and the Philippine Islands amounted to $9,350,000 in 1900, *i. e.*, the time before the outbreak of the Chinese troubles, by which these cotton exports were reduced by about four million dollars. Germany's trade in cotton goods to these same countries in the same year amounted to 6,700,000 marks, or $1,600,000.

England in 1900 reached the highest figures of the decade in exports of cotton manufactures. These were equaled only in 1890. The present year, with the average price of cotton lower by nearly two cents a pound than in 1900, shows considerable increase. The exports of cotton yarns and manufactures for the eight months ending August 31, 1900, were £47,000,000, while the same period of 1901 shows export values of £49,200,000. Still, at the very time of the publication of this most satisfactory trade report, we read in cablegrams from Manchester of an impending closing of Lancashire mills on account of American competition. In worsteds and woolens,

manufactures and yarns, the showing is less favorable, £15,848,000 being exported in 1900, against £13,468,000 in 1901.

But as we hear only of closing mills, reduction in wages, and general suffering from the woolen manufacturing districts of Germany, and as France can hardly be called a competitor in woolens, we must assume that the falling off is not due to foreign competition. The decline is, however, fully explained by the facts relating to wool prices. Wool commanding 13¾d. (27½ cents) in January 1900, and averaging about 11¼d. (22½ cents) for the eight months of 1900, did not exceed 7¾d. (15½ cents) during a similar period in 1901. Wool tops (combed wool) in January 1900, sold at £33 the pack (280 pounds), and in January 1901, at £19 10s. Other important English manufactured articles for personal use show considerable gain, the exports rising from £6,726,000 in 1900 to £7,164,000 in 1901. It is evident that the anxiety so frequently expressed by Englishmen is not justified by the international conditions represented in the trade reports of the various countries. It is not a little surprising that so little cognizance is taken of these, and so much of *ex parte* statements of individuals more or less well informed on international trade and manufacturing conditions.

The greatest concern, however, is expressed in reference to iron and steel production. Next to cotton manufacture, the products of this industry form the greatest of English exports. The formation of the United States Steel Corporation has added not a little to the uneasy feeling already existing, on account of German and American competition. What seems strange to an average observer is the readiness with which Englishmen accept the statements of our own ironmasters as to our ability to undersell England.

The proceedings before the Iron and Steel Institute of Great Britain last summer gave ample opportunity for observations of this nature. The gist of the opinions was that England was losing her trade because she had neglected making improvements and did not follow the American example of

combining, nor of locating manufacturing at points most advantageously situated for shipping purposes.[1] A cable from London the other day reported a statement made by Mr. Charles M. Schwab, president of the United States Steel Co., to Mr. Joseph Lawrence, member of parliament for Monmouthshire, to the effect that he could lay down steel billets at Liverpool at $16.50, which the British ironmaster could not do at less than $19. Basing my statement on knowledge gained on the spot in 1888, and barring later-day improvements, I presume to say that it would not be difficult for English steelmakers, under normal conditions, to meet American competition at the stated price, and even to stand ready for a squeeze.

Mr. Lawrence does not inquire into the ability of England to meet this competition, but at once accepts the statement and puts the blame on transportation cost at home. He says it costs more to transport a ton of steel by rail from Birmingham to Liverpool than from Pittsburg to New York, a distance four times greater. True as it may be that transportation charges by rail are excessively high in England, and that English roads transport to terminal points, where competition of lines is possible, and even to foreign inland points, at lower rates than they give to home shippers on their own lines, it must not be forgotten that the country is intersected by canals on which the heavy, bulky goods are usually carried. This mitigates the evil somewhat. I say somewhat. The railroads to a large measure control the canals.

I admit this is a great, a crying evil. The railroads have parceled out the country among themselves—and parliament stands guardian over the arrangement. In any other country this might prove of great injury to industries in which freight charges bear so heavy a proportion to value. But nature, knowing the character of her children, has put a saving clause into the arrangement by locating the most important iron and coal beds close to the seashore and placing the mouths of rivers at the same spot.

[1] See paper read by Mr. Garrett, of Cleveland, O., before the British Iron and Steel Institute.

The injury to the iron industries by high charges of transportation lines is therefore not so great as appears from the statements. The ironmasters have not been slow to avail themselves of their advantages. As early as fourteen years ago, when I visited inland places, formerly important centers of steel production, I found that many of the bloomaries and rolling mills, located there on account of ready coal supply and other advantages, had been removed to the mouth of the Tees or the Tyne, to Barrow-in-Furness on the coast between Lancashire and Cumberland. Those left in Birmingham do not try to compete with the Lancashire or the Yorkshire works, which have natural advantages not possessed by an inland place. The former produce forms of iron and steel which are used to a large extent in the local factories. South Staffordshire, of which Birmingham is the manufacturing center, produces a grade of iron which, in the advanced products of bar iron and steel, commands a higher price than Middlesbrough's products. While transportation of these from Birmingham may have to submit to railroad charges far in excess of American charges, yet this cannot affect the grades that would come directly into competition with American makes, the only ones to which Mr. Schwab can have reference.

The price of goods is determined by the cost of labor and the profits. The latter have been extraordinarily high in iron and steel in England, no less than in Germany and in America. The last few years were years of high carnival in prices. But it is not safe to speculate on abnormal conditions, such as have existed since 1899. History is wont to repeat itself in the iron industry in a cycle of about ten years. The prosperous years of 1869 to 1873 were followed by the depression of 1874 to 1878. Then, 1879 to 1883, prosperous years; 1884 to 1888, years of depression. After this the boom of 1889, culminating in 1893, was followed by the hard years of 1894 to 1898, which in turn were relieved by the price and trade advance of 1899. The boom will run out its allotted time, perhaps, and then — well, we will not lift the veil the gods have kindly cast over the future.

Prices keep step with trade conditions. Not to go back farther than fifteen years, let me state: *Basic pig iron* sold at Middlesbrough in 1886 and 1887 as low as 26s. a ton ($6.33); it sold in December, 1889, at 64s. ($15.57). In 1895 and 1896 it was again as low as 32s. ($7.79), but commanded 65s. ($15.82) in 1900. *Steel rails* sold at £3.17.6 ($18.85) in 1886–7, but were around £7 in 1889–90. The same commodity was down as low as £3.12.6 ($17.64) in 1895–6, but rose to £7.15 ($37.72) in the fall of 1900, when our own price was under $25. *Coal*, of course, shows the same variations in price. Times of depression and of prosperity bring to the surface remarkable elements of adaptation in the character of the Englishman. Forty-six million tons of coal shipped in 1900 netted him 38 million pounds, an average price of 16s. 6d. per ton. But he forbore to take more than 8s. 6d. per ton for the 37 million tons he shipped abroad in 1897, when trade was poor. Nothing warrants the assumption that John Bull will not show the same noble spirit of forbearance when the scales again tip downward.

We hear much of the increased cost of labor while these anomalous prices rule. But for "labor" in the surplus price we may read "profits." At the time when improvements in the economy of production were not yet considered a necessary evil that might have to be reckoned with, the labor cost was a pretty low one, judged even by our own standard. In the spring of 1890 I visited the Brimbo Iron and Steel Works in Wrexham, North Wales, near Liverpool, to ascertain the cost of making open-hearth steel. The total labor cost, based on a month's working, was $1.38. This was in the midst of the boom times. Two advances of 10 per cent. each had been previously granted. In 1887 the labor cost in steel works in Middlesbrough was 4s. 4d. ($1.05), not a very material difference. Our own cost in 1888 of making open hearth steel in Pittsburg was $1.85, in furnaces with latest improvements, and as high as $2.38 in works of older construction. If we had succeeded in reducing our labor cost by 50 per cent. in the interval we should not be able to produce steel at much less than England did then.

We have lowered the labor-cost considerably. But it must always be remembered that it has been very low in England all the time, and that England has been asleep with only one eye closed. The spirit of the times has not passed entirely unobserved. The labor-cost (inclusive of office and incidental labor) of making basic pig-iron in 1887 I found to be 4s. (97 cents). Carroll D. Wright, in his *Report on the Cost of Production of Iron and Steel*, of 1890, puts it as low as 74 cents. But the report places basic and Bessemer iron on an equal basis, which is not in line with generally known facts as to the relative quantities handled per ton of pig-iron.

At present, under normal conditions, iron can be made from Cleveland ore at 2s. 6d. (61 cents), as is reported by Mr. Kirchhoff, the editor of the *Iron Age*, who visited the field in 1900. This is on the basis of 34s. as the selling price of No. 3 iron. Every shilling advance in the selling price, under their sliding scale, brings an advance of 1¼ per cent. in wages. The selling price being 45s. at present, would add 14 per cent. to labor and bring it up to about 70 cents. When the price was 64s. ($15.57) a year ago, the increase would have been 37½ per cent., *i. e.*, a rise of 30s. ($7.30) in the selling price, and of 11d. (22 cents) in the labor-cost; making the latter 83 cents. Allowance, of course, has to be made for labor advances in the underlying materials.

Similar arrangements exist in the coal industry.[1] In a num-

[1] Of course, where the furnaces are supplied by outside sources with fuel and ore, the price differences in these commodities have to be added, and they materially reduce the profit returns. But as the ironmakers usually are owners of coal mines, coke ovens and ore beds we have to calculate the labor cost of iron, from the material in the earth to the finished iron, on this basis of ownership. Starting on the base price of labor and pig-iron to the highest point the relations of labor cost to price stand as follows, according to sliding scale;

Labor cost in ton of pig-iron when iron sells at 34s.			and at		64s.	
	s.	d.			s.	d.
a) Furnace labor	2	6			3	5
b) Mining 3¼ tons ore @ 9⅛d.	2	7	@	14⅝d.	3	11
Additional labor @ 9⅛d.	2	7	@	14⅝d.	3	11
c) Labor in producing 1¾ tons of coal @ 2s. 3d.	4	0	@ 3s.	6d.	6	1
d) Coking 21½ cwts. coke @ 1s. 6d.	1	8			2	6
e) Limestone ⅓ ton @ 1s. 8d.	1	0	@ 2s.	6d.	1	6
Total labor in ton of basic pig-iron	14	4			21	4
Difference in labor cost in pig-iron from materials in the earth					70	0
Difference in selling price					30	0

ber of mines from which I collected accounts in 1887 the total cost of labor varied between 62 and 83 cents. This is inclusive of labor outside the mine. The sliding scale provides that for every advance of 2d. in the selling price an advance of 1¼ per cent. in the wages per ton should be given to the miner. Mr. Kirchoff states that in August, 1900, the advance over the wage basis agreed upon in 1879 was 55 per cent. The figures of the above statement, which are borne out by general facts, then show that labor in time of depression costs, on an average, 73 cents the ton, and has risen in the height of boom times 40 cents, *i. e.*, to $1.13 the ton.

This is not an inconsiderable addition to wages, especially when we consider that in dull times the miner seldom averages more than four days a week, and works full time, Saint Monday permitting in the flush times. But in connection with this we must remember that the advances in price amount here to 10s. the ton.

These statements may serve as a key to an understanding of the situation when we hear of the increased cost of production due to advances in labor cost. This increase of cost is usually brought forward as an impediment to price reduction, urged on ironmasters as a means to holding the "waning trade of England."

In the matter of fuel, England is well provided. Good furnace coke can be laid down at Middlesbrough furnaces at 10s. 6d. ($2.55) the ton. If higher prices are quoted, it must be remembered that they affect to a very small extent the iron-maker. The works, as a rule, own mines, coke-ovens, and ore-beds. Iron producers cannot easily be "frozen out." Pig-iron from native basic ores, according to well authenticated facts, is producible in the Cleveland (England) district at the following figures:

	s.	d.
3¼ tons of ore at 3s. 5d. =	11	1
Coke - - - -	10	0
Limestone - -	2	0
Labor - - - -	2	6
Incidentals and supplies	1	0
Total - - -	26s. 7d. = $6.47.	

The case is not altogether hopeless for England, even when our southern iron is considered. This could be made, and was made in 1898, at about $5.75. But as the southern furnaces are situated at a considerable distance from tide water, the British iron is the cheaper of the two at the respective ocean shipping places. Nor is the case of hematite iron one to justify exuberant expectations. True, the native ores found in Cumberland and North Lancashire are not very abundant. The main supply comes from Spain. Swedish and Norwegian ores have been supplementing these of late. Spanish (Bilbao) ore, of 50 per cent. iron, has been 13s. 6d., laid down at the furnace at the mouth of the Tees. At this price, the cost of the ore put on board ship is 7s. ($1.70) and freight, 6s. 6d. ($1.58). Late quotations from Middlesbrough (England), the center of the Cleveland iron district, were 14s. 6d., and at the time of writing (October), quotations have again advanced, under improved demand, to 16s. Here, too, demand fixes prices.

The Spanish methods of mining are primitive. Improvements to bring up the standard of mining efficiency to the one ruling here are within the reach of probability, and would insure a full supply for all needs at the lower price. The cost would stand as follows:

	s	d
Two tons (50 per cent. ore) at 13s. 6d. =	27	0.
Coke	10	0.
Limestone	1	6.
Labor	2	6.
Incidentals and supplies	1	0.
	42s.	0d. = $10.22

It has never been claimed that Bessemer iron, from the Ohio valley or from Pittsburg, could be laid down at tide water at this price. No allowance for profits or capital charges is made in these two statements. These do not play an active part in English iron and steel in times of depression. They are not considered in their prices by our steel magnates when they speak of England as a dumping field for their surplus product.

An opportunity was offered to American iron and steel producers to test the English markets as receiving centers for their surplus products during a great part of the last twelvemonth From the month of August, preceding the presidential election till after the formation of the great trust, iron and steel prices had fallen considerably towards the point from which they had started on their upward course at the beginning of 1899. On the other hand, English prices during that whole period were up to the highest level ever reached in recent times. Southern iron No. 2, at Birmingham, Ala., was $11. Middlesbrough (England) iron No. 3 was 65s. 6d. ($15.94) in November, and 63s. ($15.33) in December.

American steel rails sold between $24 and $26, while English rails reached as high as £7.15 ($37.72) in September, in November were at £6.15 ($32.85), and in January, 1901, commanded £6.10 ($31.63).

A lack of shipping facilities may be quoted in explanation. Still it is well known that cotton steamers in the South and grain vessels in the northern harbors were not wanting at the time. At least we had no difficulty in getting all the berth room required for these commodities on ships flying the British flag. Pig-iron is gladly taken on board by masters of vessels at concessions and here was a good opportunity for offering a premium even. For steel products the margin was much greater than for iron, so that the plea of lack of transportation facilities cannot well be entertained.

The difficulties in the way of disposing of surplus products are not exhausted by the price question alone. But to treat them here would require a broader margin of space than is within the lines I have set for the present discussion.

America has made great improvements in the economy of producing iron and steel. The labor cost in Bessemer pig-iron in Pittsburg in 1887 was $1.40, and in Bethlehem $1.25 a ton. I am informed that it is not over 70 cents now. Wages have not been reduced. But wheelbarrowing the materials to the lift and hoisting them to the cupola has been done away with, and

automatic machinery for loading and emptying the trucks, and inclined-plane railroading to the cupola, have been substituted. Substituting the brain for muscle is the only means by which we are able to hold a commanding position. But with all our forging ahead, we only arrive at the position where England has been all the time. It is well to consider all these points, including the proximity of the iron and coal beds to the shipping points of iron and steel, and not to forget that we have to transport our raw materials to the assembling point over hundreds of miles, and then carry the finished product another five hundred miles to tide water, before we arrive at the point where England is placed by natural advantages.

The "ocean transportation arrangements" contemplated by the steel trust, by which, as Mr. Schwab said, the price would be still further reduced, do not appear very serious from the point of view gained by a consideration of these facts. The trust may continue buying up British steamship lines to the end of its available resources without great injury to any British interest, least of all to England's ocean transportation interest.

The rapidity with which she is filling the vacuum in her merchant fleet, caused by the transfer to our magnates of finance of craft more or less antiquated, is remarkable.

The steamers of ten years ago show rather poorly, both in speed and economy of handling, when compared with the products of the shipyards of today. British shipyards turn out in two months more tonnage than was contained in the fleet that was lately transferred to Mr. Morgan. For spoliation of this kind England would willingly work her shipyards night and day. In the eight months ending August 31, 1900, the steel vessels sold to foreigners were valued at £4,843,000 ($24,000,000). The same period in 1901 shows £6,126,000 ($30,000,000). Englishmen interested in these industries will not consider it a very ill wind if the present rate of "decline" will keep up in the future.

Germany, whose prosperity protectionists the world over were happy to extol in the same breath heralding the decline in

British commerce, is suffering from depression, which all the reports describe as deep-seated, general, and growing. Foreign markets are non-responsive, and home-demand, with poorly paid labor, is not able to come forward to succor the suffering industries. In the face of a dreaded winter, and in a year of poor crops, the imperial government, instead of alleviating suffering by freeing food stuffs from tax burdens, proposes to raise duties on them to double the former onerous amount. Free traders will see a satisfactory connection of untaxed necessaries of life and the undiminished trade prosperity of the only commercial nation, which has rid itself entirely of the system of spoliation of the poor, covered by the guileless name of "protective tariff."

I am not prepared to say that it is on this account that present trade figures of England show no abatement, while those of Germany are declining. Profits, as appears from prices, are still so high that considerably lower prices could be supported without great loss to either of the competitors. But that her superiority as a manufacturing nation is unassailable by nations who depress the standard of living of their working classes by protective legislation, is a proposition which needs no expounding. The trade figures show the enormous strength of Great Britain, and suggest that it is well not to become too sanguine when we read the statements concerning our great opportunities consequent on England's decline, which now fill the prints on both sides of the Atlantic.

The declines which are noticeable in English exports of iron and steel are in the coarser products. This is entirely due to the waning consuming capacity of manufacturing countries which have been England's chief customers in pig-iron and steel, notably Germany, France, and Holland. The exports in iron and steel in the eight months under review were, in 1900, £22,411,000, and, in 1901, £16,927,000, a falling off of £5,500,000. This is made up of £2,600,000 in pig-iron, £2,900,000 in bar and cast iron and raw steel. In steel rails £2,500,000 was exported, against £2,033,000 in 1900, an increase of 20 per cent.

Prices brought back to the basis of 1900 would show considerable increase in export value in all items outside of the raw forms of iron and steel. The figures of 1900 have been maintained for the export of all kinds of machinery except those for textile manufactures. This means that in all non-manufacturing countries the demand for English mill work and machinery has remained unabated.

The gigantic combination that has lately been formed in the United States is considered a menace by England. The statement made by Mr. Charles M. Schwab, before the Industrial Commission, indicates the policy the trust intends to pursue in regard to foreign trade. He stated; "When we have as much as we have today we are not anxious to sell at low foreign prices, but when our mills are not running steadily we will take anything at any price, even if there is some loss in so doing, in order to keep running." The speech lacks nothing in plainness. Still, intention is one thing and execution quite another. So far as England's home trade and European trade is concerned, it will be found that the threatened inroad will meet with difficulties.

The test of strength is the low-price basis of the lean years and not the high-price basis of a boom period. "When our mills are not running steadily," it may be safe to conclude that the time of reaction has set in, the periodic recurrence of which has been referred to above, and which does not affect English trade any less than it affects ours. England will make a virtue of necessity and come back to hard-time prices, just as she has done before. It has been shown at what prices England can produce iron and steel. To meet them at English ports, taking Pittsburg as the American starting point (since the trust's manufacturing centers are not located nearer to seaport than this inland town), would involve freight and other charges for rail and ocean transportation of not less than from four to five dollars a ton. Bessemer iron would have to be delivered at $6 to $7 on board cars at Pittsburg, steel rails at $12 to $13, and billets at $10 to $11, in order to meet English prices at the shipping or receiving dock in England. The great combinations,

known under the name of trusts, are advertised and commented on as denoting an economic and industrial advance. In the same breath we hear the old system of industrial management and open competition decried as wasteful and unable to satisfy the best interests of the people under the modern aspects of industrial development. I will not deny that there is economy in dismantling old works whose output has become obsolete, or which are unprofitably situated, and erecting in their stead new works supplied with all the latest improvements and scientific appliances.

But this does not require the presence of a trust. The process of weeding out the decrepit has been most vigorously conducted under the aegis of competitive management. "Destructive competition," as a consequence of this process of rejuvenation, was the forceful argument of the promotor organizing the trust. The road of progress is strewn with the relics of competitive war. They are the tombstones of obsolete methods and the milestones of general progress. I have intimated above the progress that has been made in blast furnace construction. Immense sums have been spent in rebuilding American equipment. The new furnaces are of enormous capacity. The Lorain Company erected two stacks a short time ago of 350,000 tons capacity, which is 3,350 tons a week for each furnace. This is six to eight times the capacity under the practice in general use but a short while ago. But size alone is not necessarily conducive to cheap production. In 1887 I was permitted to examine iron works of America and England. I found furnaces in Bethlehem, Pa., which produced bessemer iron at a labor cost of $1.25 a ton. The furnace had all the then introduced improvements. But the capacity of the largest of the six furnaces[1] run by the company was only 600 tons. Newly erected furnaces near Pittsburg, which I visited at the same time, had a capacity of 1,400 tons a week. Their labor

[1] They were Siemens furnaces, using the waste gases for generating steam for their blowing engines. Their labor cost, as stated, was $1.25 a ton, while the cost of production of the old fashioned furnaces without these appliances was from $1.50 to $2 a ton.

cost was $1.40. General wages in Bethlehem were $1.25 a day, and in the Pittsburg works $1.40. This would bring the cost to the same level of figures on the same rate of day wages.

English furnaces, and I examined the workings of quite a number of them in and around Middlesbrough and in Staffordshire, did not exceed in size that given for Bethlehem. The cost of producing Bessemer iron, where a smaller proportion of tonnage of material is handled than in basic iron on account of the richer character of the ores, was 72 cents, as stated before. English ironmasters then did not consider our practice of large output per furnace as worthy of imitation by them. The large furnace with our high blast requires re-lining every two to three years. Aside from the expense, it necessitates stopping one furnace for several months each year, where two furnaces are employed, while the entire plant is unproductive for a time every second or third year where only one furnace is standing.

One of my English informants, an ironmaster of thirty years experience, assured me that he had no re-lining done to any of his six furnaces for a space of sixteen years.

I may add here incidentally that our cost of iron-making is increased in northern localities somewhat on account of the expense of storing the materials in the furnace yards and of rehandling them, due to weather conditions in winter, closed lake navigation, and other interruptions in transportation. England's open winters permit direct handling of materials all the time.

In steel-making, likewise, it is not found that the great capitalizations lead to reductions in cost of production such as is claimed for them. The cost in the older English works, untouched by late improvements as they are, can, as has been shown, stand comparison with our cost from works of latest construction.

The great size and output of American works may be very avantageous from our point of view. But it does not follow that our practices introduced in England or Germany would meet with equal success. The industries dependent on iron and steel

are far more diversified than ours. We work for home demand, generally very uniform, and sell the surplus products wherever we can find trade for them. The mills in Europe are used to accommodating themselves to the most varied demands of a trade that is scattered over the entire earth. This necessarily affects the steel maker no less than the demand for iron and dependent materials.

But it would be a mistake to suppose that England has not been in possession of all the advantages that can be claimed as legitimately arising from combinations, such as place control of all the underlying industries into the hands of the final producer. The difference between us and England is this, that their combinations are the healthful ones the growth of efforts of individuals for industrial ends, while ours in their latest developments are necessarily coupled to financial ends to which the industrial ones stand in a secondary position. The substitution of corporate management for individual effort may prove its disintegrating influence in times of reaction, when new vigor may come to play its part in rival enterprises.

To what extent the union of all the different parts of the industry under one control can be made possible without the assistance of the trust promoter, is shown by Krupp in Essen, and no less by a number of English concerns.

One of the latest American observers visiting England, the editor of the *Iron Age*, deserves to be quoted in corroboration of this statement as well as of what has been said in preceding pages:

> If that be true [the production of Cleveland iron at 28s. a ton] then some of our producing districts, not excluding the most favorably located, do not possess extraordinary advantages. "Spread eagleism" in industrial matters is likely to cost too dear to be encouraged, and it is far better that the fact be known that cheap iron is made elsewhere outside of the lower lake district, Pittsburg, the Ohio valley, or Alabama, and that the Cleveland district must be numbered with others in England, and with the Minette district[1] on the Continent, as a leading competitive locality, in the world's

[1] This ore district comprises parts of Luxemburg, parts of Lorraine, and adjacent parts of France.

open market. The Cleveland district and the rolling mills and steel works of the New Castle section make a very great variety of products. Conspicuous among them are rails, plates, structural materials, wire, and bars. In fact some of the great companies build ships, supplying the greater part of the material from the ore up.

The trust possesses no advantages that have not previously been employed by individuals. The important point is this: At what cost can the unit of account in production, the ton or pound be laid down at the mill door and at competing points, and not the number of tons or pounds produced or the number of furnaces and steel converters run under one management. The writer inclines to the belief that the facts here stated justify the assumption that the large combination directed by non-responsible hands will not be as effective in the end of reaching most economic production as was the old system of free competition and individual, responsible leadership.

The Carnegie works have of late become the cheapest producers of iron and steel in the northern part of the United States. Like the English and German works cited, they owe their position to the master mind of the chief owner and director. Always in advance in the adoption of the most recent approved inventions and discoveries, they were able, from the gains of their own works, to add annually to their productive power, so that after the lapse of ten years they had become the arbiter of the iron and steel industry of America. Their Homestead works alone, in 1890, had a capacity of 295,000 tons; in 1898 they had grown to an annual capacity of 2,260,000 tons.[1] The question of submission or destruction has its terrors if uttered by voices that have the support of means, of which these colossal figures give an idea. We can understand the financial necessity which urged the present members to form the trust combination, but cannot at all understand that the consumer is deriving the least benefit from combinations, even if they were not organized with the chief object in view to uphold prices, and to prevent competition.

[1] EDWARD SHERWOOD MEADE, *Quarterly Journal of Economics*, August 1901.

We have not yet become cognizant of any facts that nullify the recognized advantages to the community of unhindered competition. After we have gone through our present debauch and paid the penalty, we shall come back to the old views, expressed a hundred years ago and more, but which will not grow obsolete so long as man seeks his fellow man to exchange commodities.

Competition is the supreme arbiter of price, the legitimate and equitable regulator, which governs the market with justice and moderation; she puts limits to all excessive pretensions; she restrains greediness and avarice and constrains them to content themselves with reasonable profits; she does not protect or oppress, she does not hate and does not love, she does not give nor take away; always impartial she views with the same eye all the conditions, and distributes to everybody in the sum total of public prosperity the part that is legitimately due to him.[1]

Could the same be said of the trust? Its aims and motives are the opposite, and opposite terms from those here employed to describe the benefits arising to mankind from unhindered competition would furnish a portrait of the trust that would be recognizable by everyone.

JACOB SCHOENHOF.

NEW YORK.

[1] Il *colbertismo, osia della liberta del commercio dei prodotti della terra.* Pamphlet by Count MENGOTTI, Florence, 1792; introduced by CIBRARIO, *Economie Politique du Moyen Age;* translated into French by M. Wolowski.

VALUE IN ITS RELATION TO INTEREST.

I.

THE explanation of interest has been sought in the increase of aggregate value[1] rather than in the increase of commodities or utilities. For instance, Böhm-Bawerk: ". . . . what people look to in economic life is the value of goods . . . . To obtain the basis for the principal part of our work — the explanation of interest — we require to go into the theory of value."[2] Hugo Bilgram says: ". . . . it will be necessary to give a brief outline of the theory of value, in which Professor Böhm-Bawerk rightly seeks the law of interest."[3] Let us see whether a simple illustration will not identify the increase of commodities as the real fountain of interest.

If we accept, in this discussion, the ordinary conception of value, namely price,[4] it can be shown that an increase of aggregate value in the individual product is by no means indispensable to a surplus that may be appropriated to interest. An increase of output, although attended with a decrease in aggregate value, will provide for the payment of interest. To illustrate, let us consider four types of industries, A, B, C, D, all operated without capital, and suppose the yearly product of

[1] As appropriate in a discussion of the interest question, "value" in this paper is confined to the general sense of exchange value, or what Böhm-Bawerk describes, preliminary to his formal treatment of interest, as "objective exchange value." The exchange relation of commodities to the money standard as well as to other commodities is meant to be covered in this extended sense of the term.

[2] *Positive Theory of Capital*, p. 125.

[3] *Quarterly Journal of Economics*, January 1892, p. 191.

[4] Capital is borrowed in terms of money, and the returns must be made in the same standard, both principal and interest. It matters not whether money appreciates or depreciates during the term of the loan. It is the nominal sum, and in addition the stipulated interest, say 5 per cent., that must be paid. If the standard appreciates, the 5 per cent. is nevertheless exacted. If depreciation takes place, no more than the stipulated rate of interest will be paid. It is easy to see, therefore, that questions of interest, not of the philosophy of interest, but of the amount of interest in any specific case, find expression in terms of money value.

each commodity is one thousand units.[1] Suppose, for simplicity, that this yearly product has the value of $1000 in each case, also that we have but four operatives to deal with, one for each industry, and that the aggregate product is consumed yearly, the commodities exchanging against one another, unit for unit, each man consuming 250 units each of the four types of commodities, leaving no accumulation for capital. Eventually one of the men conceives the notion that $1000 of capital will enable him to increase his output manyfold. He borrows the $1000, or what is equivalent to 1000 A, and let us suppose as the result at the end of the year that his product has been 4000 instead of 1000 A. Böhm-Bawerk[2] emphasizes the claim that so far as the productive relation goes it cannot be shown that the increase of value (money value, of course), due to the employment of capital, is in excess of the value of the capital destroyed in the process, and he expects it to be taken for granted that an excess of this value is indispensable to interest. In the case we are considering the aim will be to show that the increase of *commodities*, independently of increase of total *value*, provides for interest.

Let us suppose, then, that the 4000 A has the value of $2000. This will allow for 2000 A to replace the $1000 capital borrowed, and leave 2000 A to the borrower, which share, on the basis of 4000 A at $2000, has a value equal to that of his former product of 1000 A.

At first sight, it appears that interest is entirely excluded by this result; but let us examine the situation further. Suppose the capitalist is a consumer of A, B, C, D, and that he elects to take the 2000 A in lieu of the value $1000. At the present value of A, he must give 1500 units of that commodity for 250 each of B, C, D, that is, 2 for 1 of each of the latter. This leaves him 500 A, whereas formerly, when 1000 A had the value of $1000, he could have retained but 250 A. To be sure, the 500 A, expressed in terms of the standard, has a value equal

[1] That is to say, without borrowed capital, and with only primitive instruments, simple tools, too insignificant to figure in a problem of interest.

[2] *Positive Theory of Capital*, p. 122.

only to the former value of 250 A; but, as a consumer, he has a surplus of 250 A, which may be considered as interest indeed, although it does not figure as *nominal* interest.

So far, we have not arrived at interest in the ordinary sense, that is, a surplus of money value to the lender; but the search is not exhausted. The borrower also is possessed of 2000 A. To be as well off as in former years, he must have 250 of each of the four types of commodity. As in the case of the capitalist, 1500 A will secure him 250 each of B, C, D, leaving him 500 A, or a surplus of 250 A. This surplus may be applied to the payment of interest, showing that interest may be paid regardless of any excess of value expressed in terms of money. Indeed, a slight decline in this aggregate value is not incompatible with the payment of interest, while still leaving the borrower as well off as formerly.

Suppose that a unit of A has declined to $\frac{10}{21}$ its former value, or to a little less than $\frac{1}{2}$. On this supposition it will take 2100 A to replace the $1000 borrowed, since $\frac{10}{21}$ of 2100 = 1000. This leaves to the borrower 1900 A, which has a value of $\frac{10}{21}$ of $1900, or about $905, showing a decrease in aggregate value of $95. How does this affect the condition of the borrower? As before, he exchanges A for B, C, D, but this time at the rate of 21 for 10. For 250 each of B, C, D, at this rate, it will take 1575 A, since $\frac{10}{21}$ of 1575 = 750. This leaves him the difference between 1900 A and 1575 A, or 325 A, showing a surplus of 75 A, which surplus may be applied to interest.[6]

[6] In this example, A's product could show a decline in value of $133.33⅓ before reaching the point at which interest must cease, or the borrower suffer a disadvantage. At this point the unit money value of the commodity is $\frac{7}{15}$ its former value. On this supposition 2142⅞ A will restore the borrowed capital, since $\frac{7}{15}$ of 2142⅞ = 1000. 1607½ A will secure 250 each of B, C, D, as $\frac{7}{15}$ of 1607½ = 750. Finally A will have left 4000 − (2142⅞ + 1607½), or 250 of his own commodity. This ratio, $\frac{7}{15}$, is obtained as follows:

First deduct 250, to be retained by A, from 4000 A, and the remainder, 3750 A, must make good the borrowed capital and purchase 250 units each of B, C, D. These items have a value equal to $1750. If we let x = the ratio sought, 3750 x = $1750, or $x = \$\frac{7}{15}$.

Even at this decline of total value, amounting to $133.33⅓, the community, including the capitalist, is better off than before, since the latter commands a surplus of 285⅞ A, and B, C, D each has the same surplus of A, owing to the rate of exchange of A against B, C, D, 7 to 15.

The example proves that increase of commodities, rather than increase of aggregate money value must account for interest.

It is proposed now to show that increase of aggregate value, in its true significance, must normally accompany increase of commodities, or utilities, so that increase of the former is tantamount to affirming increase of the latter; and that while to attribute interest to the increase of value, in this sense, is justifiable, it is more logical to go at once to the foundation of both value and interest, namely, increase of utilities, for the principle we are seeking.

In the example cited, suppose that A had been the standard of value, what would the effect have been on aggregate values? Let the case stand as before, with regard to the relative unit values of the various commodities. A being the standard, the values or prices, of B, C, D would have doubled, making an increase of total value in terms of A, of 100 per cent. Why should not A be taken as the standard as well as a piece of coin? If, under the circumstances B, C, or D had been the standard, the case would have stood as originally, when money was used as the standard, since B, C, and D, remained stationary, expressed in terms of coin. But suppose B, C, and D had resorted to capital with the same result as A. The outcome would have been no increase of aggregate value, measured in the usual standard of money, but vast increase in real welfare and in possibilities of interest.

The suggestion that A, B, C, or D might have been taken as the standard opens the way to the determination of values on the basis of a standard, that automatically and insensibly averages the relative changes of the various important commodities, thus affording a trustworthy basis for a stable scale of values. This is the multiple standard.

Take A, B, C, D as types of important commodities. At the beginning of our inquiry, we will suppose them equally important, and for the sake of simplicity we will suppose the output of each commodity for a given period 1000 units. The standard of value shall be a complex containing $\frac{1}{4}$ of a unit of

each. Call this composite, or multiple, unit M. Then 1000 A = 1000 M. B, C, D each has the same value, so that the total product of A, B, C, D, for the given period, equals in value 4000 M. Suppose now that the output of A, by reason of increased efficiency or industry, rises to 3000 units for the given period, what must be the result as to the aggregate value of the four commodities? The standard of value is the multiple unit, containing $\frac{1}{4}$ of a unit of each commodity. Evidently, 1000 units of each commodity, as before, will furnish 4000 units of the standard. Hence the value of these 4000 units, 1000 of each commodity, is 4000 M. There is a surplus of 2000 A. This surplus must have a value, the measure of which, of course, depends on the relative change between A and the remaining commodities. If A declines in relative value in the same ratio as its increase in product, the 2000 A surplus is equal in value to $\frac{1}{3}$ of 2000 of either B, C, or D. But a decline to $\frac{1}{3}$ the value of B, C, or D does not express the decline as referred to the standard. However, this relation affords the basis for computing the real decline. The constituents of the standard are in relative value, $\frac{1}{3}$, 1, 1, 1, total, $\frac{10}{3}$. Dividing by 4 gives $\frac{10}{12}$ or $\frac{5}{6}$, to express the relation of the standard to three of the four constituents. $\frac{1}{3}$, 1, 1, 1, divided successively by $\frac{5}{6}$ give the new unit values of A, B, C, D. That is, the value of A is $\frac{1}{3} \div \frac{5}{6} = \frac{2}{5}$. B, C, D are each in value, $1 \div \frac{5}{6} = \frac{6}{5}$; $\frac{2}{5}$ is $\frac{1}{3}$ of $\frac{6}{5}$, which gives the correct relation between A and the remaining commodities. $\frac{2}{5}$, instead of $\frac{1}{3}$, is the real unit value of A. This value $\frac{2}{5}$, applied to the 2000 surplus product of A, gives the total excess value, 800 M. This excess value may be verified as follows:

3000 A - - - - - -	@ $\frac{2}{5}$ M =	1200 M
3000 B, C, D (1000 of each) -	@ $\frac{6}{5}$ M =	3600 M
Total - - -		4800 M
Value of former product - - -		4000 M
Showing increase in value of - -		800 M

It will be noticed above that the total for each of B, C, D, 1200 M (3600 ÷ 3) is the same as that for A. This is as it

should be, since the ratio of increase in quantity, 3000 to 1000 for A is just offset by its ratio of decline in unit value, compared with B, C, or D, $\frac{1}{3}$.

An obvious criticism of the above exhibit is the apparent change in the value of the standard from 1 to $\frac{5}{6}$. This change is apparent only. A form of presentation could have been made that would *apparently* show an advance instead of a decline. For instance, express the relation of the new unit values of A, B, C, D by the scale 1, 3, 3, 3, instead of $\frac{1}{3}$, 1, 1, 1. $1+3+3+3=10$; $10\div 4=\frac{10}{4}$ or $\frac{5}{2}$. $\frac{5}{2}$ will now be the apparent value of the standard. Dividing 1, 3, 3, 3, successively by $\frac{5}{2}$ gives, as before, $\frac{2}{5}$, $\frac{6}{5}$, $\frac{6}{5}$, $\frac{6}{5}$, as the new unit values of A, B, C, D. Neither $\frac{5}{6}$ nor $\frac{5}{2}$ should be taken as the value of the standard. $\frac{5}{6}$ simply expresses the relation of the standard to the commodities B, C, D, the latter being represented by 1. Likewise, $\frac{5}{2}$ will be its relation to A, if the latter be supposed to remain constant at 1. The instructive view is to regard the value of the standard constant at 1. Then the unit values of B, C, D will show a slight increase as computed above, while the unit value of A will show a considerable decline. In this view the value of the standard is 1, and the values of A, B, C, D, respectively, are $\frac{2}{5}$, $\frac{6}{5}$, $\frac{6}{5}$, $\frac{6}{5}$. In truth, the value of the standard must remain at 1 from the very fact that it is the standard. All values must be adjusted to the scale of the standard.

We have shown that an increase of commodities involves an increase of aggregate value for the totality of commodities, on the basis of the multiple standard. This excess of value is due entirely to the excess of commodities, and the amount of this excess value depends altogether on the relative change of unit value in the commodity showing the excess of product. This does not mean that the increased product, A, standing by itself, surpasses the former product in value. In extraordinary cases, the value of a product may be entirely annihilated. In this extreme case, the aggregate value of all products shows neither decline nor increase. It does not decline, since the quantity, 1000 units of each of A, B, C, D, provides for the 4000 units, the same

number as formerly, of the standard M. It does not increase, since the surplus product 2000 A, by hypothesis has no value.

The greater the decline in value of any specific commodity that retains its utility, the better for the community as a whole, since the abundance of utilities is the *desideratum*. It will be interesting to note at what point in the decline, the maker of that product passes from a condition of advantage to one of disadvantage. We saw, in the case of a money standard, that the value of a commodity could suffer a ratio of decline greater than the ratio of increase of product, without jeopardizing the welfare of the maker. This will not hold in the case of the multiple standard. Equality of these ratios just maintains his condition, without favor or prejudice. In the example cited, when the product of A rises from 1000 to 3000, and the unit value declines to $\frac{1}{3}$, as compared with the standard, we have for the value of the total product, 3000 A @ $\frac{1}{3}$ M = 1000 M, and 1000 M contains just 250 each of A, B, C, D. This result corroborates the claim that the multiple standard correctly differentiates the values of commodities, rather than the single standard.

The relations deduced afford the basis for computing the ratio of decline in value of A to the remaining commodities, B, C, D, necessary to offset the increase in product. If A exhibits a threefold product, while that of B, C, D remains the same, we have seen that a decline to $\frac{1}{3}$ its former value, on the part of A, compared with M, the multiple standard, just maintains the aggregate value of the product. But the values of B, C, D, as compared with the standard, will advance meanwhile from 1 to $\frac{11}{9}$.[1] Hence the decline of A to $\frac{1}{3}$, compared with the standard, which is 1, is equivalent to a decline to $\frac{8}{11}$, as compared with a commodity which stands at $\frac{11}{9}$ since $\frac{8}{11}$ of $\frac{11}{9} = \frac{1}{3}$. That is, A must decline to a point much less than $\frac{1}{3}$ (nearly

[1] This result is obtained as follows: If A declines in value to $\frac{1}{3}$ M, $\frac{1}{4}$ of a unit of A contained in the standard has the value, $\frac{1}{12}$. The remaining $\frac{11}{12}$ of value must be provided by the three quarter-units of B, C, and D. If $\frac{3}{4}$ of a unit has the value, $\frac{11}{12}$, one unit has the value, $\frac{11}{12} \div \frac{3}{4}$, or $\frac{11}{9}$.

to $\frac{1}{4}$), as compared with B, C or D, before it loses its excess value. This may be verified as follows:

1000 units of B, C or D - - @ $\frac{11}{9}$ M = $1222\frac{2}{9}$ M
1000 A = $\frac{3}{11}$ of $1222\frac{2}{9}$ M - - - = $333\frac{1}{3}$ M
3000 A = $333\frac{1}{3}$ M × 3 - - - - = 1000 M

We have seen that the aggregate value of all commodities, measured in the multiple standard, must increase with an increase of product. How the value of any specific commodity will act, in relation to its increase in product, will depend on a variety of circumstances, and cannot always be predetermined. With any specific commodity we are not concerned; but as to commodities in general, increase of product, in any instance must be accompanied by increase of value. That is to say, this must be the rule governing the movement of value, or we have an extraordinary circumstance confronting us, namely, that increase of value attends the industries that exhibit no change, or enterprise, or activity, at the expense of those which are enterprising. This condition, or predicament, follows directly from the exposition thus far. If the aggregate of commodities shows an increase of value, this increase must attach to such industries as have increased their product, or to those which have not. In the example cited, we saw that the values of A, B, C, D, each increased from 1000 to 1200 M, when the product of A rose from 1000 to 3000, and the decline of the unit value of A was to $\frac{2}{9}$ of the standard, or to $\frac{1}{3}$ that of B, C or D. That is, B, C, and D must rise in value in the ratio of $\frac{6}{5}$. If A declines so as to show no increase in aggregate value, that is, to $\frac{1}{3}$ M, or $\frac{3}{11}$ of that of B, C or D, then must B, C, and D advance still more. The consequence would be that listlessness and stagnation would enjoy all the fruits of alertness and enterprise. It is needless to state that the emoluments of real life are not so distributed, ordinarily. Hence it is confidently submitted that commodities taken individually, as a rule, increase in aggregate real value with increase of product. As has been remarked, the community in general benefits from the welfare of any specific industry, but the industry itself reaps the larger share.

That is to say, in the given example, B, C, D would be likely to show a slight increase in value, while A would show a marked increase. If a unit of A, for instance, should decline to $\frac{1}{2}$, instead of to $\frac{2}{5}$, the total value of A (3000 units) would considerably exceed 1200 M, while the average increase of B, C, and D would fall below 200 M.[1]

Recurring to the question of interest, it will be easy to determine the degree of productivity that will justify the employment of capital. First, what would be the effect of a decline in the product of one of the commodities? Supposing the output of A were 800 instead of 1000. Since an increase of output in the case of one commodity involves an increase of aggregate value of all commodities, it follows, as a matter of course, that a decrease of output will mark a decrease of this aggregate value. This is true, whatever be the relative appreciation of the commodity in question. Let A, for instance, rise in unit value to 97 times that of its companions, and the result may be computed as follows: $(97 + 1 + 1 + 1) \div 4 = \frac{100}{4} = 25$, the relative value of the standard. $\frac{97}{25}$, $\frac{1}{25}$, $\frac{1}{25}$, $\frac{1}{25}$ are the new values of A, B, C, D, referred to this standard, M.

800 A - - - - - -	@ $\frac{97}{25}$ M = 3104 M
3000 B, C, D, combined - -	@ $\frac{1}{25}$ M = 120 M
Total - - - - - - - -	3224 M

as against 4000 M, the value of the former product. To show that A must have its full quota, 1000, to reach the aggregate, 4000 M, it is necessary only to take the product, $\frac{97}{25} \times 1000$, or 3880 and add to 120 the result for B, C, D, and the sum is 4000 M.

What is of more significance, the appreciation of A in a greater ratio than the decrease of its product works to the great disadvantage of the remaining commodities. If A appreciates in relative value as 10 to 8, while its product declines in the

[1] If the unit value of A is $\frac{1}{2}$, supposing no relative change to one another in B, C, and D, their value would be as follows; $\frac{1}{2}$ of $\frac{1}{4} = \frac{1}{8}$; $1 - \frac{1}{8} = \frac{7}{8}$; $\frac{7}{8} \div \frac{3}{4} = \frac{7}{6}$.

1000 units of B, C or D - - - -	@ $\frac{7}{6}$ M = 1166$\frac{2}{3}$ M
3000 units of A - - - - - -	@ $\frac{1}{2}$ M = 1500 M

same ratio, 1000 to 800, there will fall to each share 250 each of B, C, D, and 200 of A, an equitable apportionment, although marking a decline of 50 A in the welfare of every individual. While any decline in product would thus be disadvantageous to the community as a whole, a decline accompanied by a larger ratio of appreciation on the part of one product would work, or might work, to the advantage of that commodity for a time. But consider the ultimate consequences. Suppose all industries should vie with one another to reduce the product in order to reap the advantage of undue appreciation of value. A community, collectively, for any period of time, and, individually,[1] in the long run, can profit only by an increase in output. We may then exclude the case of the temporary feasibility of interest that might attend the decline of products, and consider only the case in which the products show an increase. It will appear in the average case that interest is feasible only when the product shows an increase in excess of that amount which represents the value of the capital borrowed at the time of borrowing.

If A should borrow capital equivalent to 1000 A, and the excess of his product should fall below 1000, that is, his total product fall below 2000, so far as the community, A, B, C, D, is concerned, we should have a case of real decline of product, since 1000[2] of A's output would just offset borrowed capital,

[1] It is true that society will carry a few industries of comparatively slight importance, whose output is regulated with a view to large returns from a restricted output; but industries in general could not pursue that policy, since there would necessarily follow a decrease of total utilities, and, consequently, of aggregate value, to be distributed.

[2] There might be a slight appreciation of value in this case, the effect of which would be to reduce the quota required to reimburse the capitalist below 1000, and increase the residue above 800. But the change of value, resulting from the use of borrowed capital alone, could not be so great as to raise the residue as high as 1000, since in that case the 1000 A retained by the maker would have the value of 1250 M (800 : 1000 : : 1000 : 1250), and evidently no such contingency could arise as that 1000 A produced with the aid of borrowed capital should exceed the value of 1000 A produced independently, other circumstances remaining the same. Hence the capitalist's share could not fall as low as 800, nor could the borrower's rise as high as 1000. In fact, the logic above would fix the minimum limit of the capitalist's quota and the maximum limit of that of the borrower at 900.

while the remainder falls below the product when working independently of borrowed capital. This condition, as we have seen, would exclude the feasibility of permanent interest. If, however, the product exceeds 2000, a surplus of aggregate value is the normal result. There is no guaranty of interest in any specific case, because there is no uniform law governing the change of value consequent upon change of product; but the normal law of change must allow for a surplus aggregate value from which interest may be paid.

For instance, if the product should be 2500 or 3000, and the unit value of A should be maintained, it is evident that the 500 or 1000 excess product would provide for interest. The increased product, however, is apt to be accompanied by a decreased unit value. But decrease in the unit value of A means increase in the unit values of B, C, D. This decrease of A's value, nevertheless, could not normally extend to the point where B, C, D secure the advantage over A, as that would be a premium on immobility or incompetence. If the decrease should stop short of this point, our discussion has shown that a surplus remains to A which may be applied to interest.

It may be interesting to note that in the case cited above, namely, the case of a surplus A product, the trio, B, C, D, would have a surplus which, with A's residue, exceeds the latter's borrowed capital, whatever decline in value A's product should suffer, up to the point of absolute annihilation. Let A's product be 3000, the borrowed capital being 1000 M, or what was equivalent to 1000 A at the beginning of the enterprise. Suppose a unit of A, for instance, should decrease to $\frac{1}{256}$ its former value, or to $\frac{1}{256}$ M, B, C, D would rise in value to $\frac{33}{256}$ M, since $\frac{1}{4}$ of a unit of each commodity at the prices, respectively, $\frac{1}{256}$, $\frac{33}{256}$, $\frac{33}{256}$, $\frac{33}{256}$ M, added together, equals 1 M, the standard $\left[\frac{1}{4} \text{ of } (\frac{1}{256} + \frac{33}{256} + \frac{33}{256} + \frac{33}{256}) = 1\right]$. Now, at the rate $\frac{1}{256}$ M for A, and $\frac{33}{256}$ for B, C, D, the latter three commodities would exchange against A 1 for 33—that, is, B, C, D could receive their quota, 750, of A, or 250 to each, for $\frac{250}{33}$ each of B, C, and D. This would leave a surplus to these three of $250 - \frac{250}{33}$ of each commodity, B, C, D $250 - \frac{250}{33}) \times 3 = (750 - \frac{750}{33})$ = total surplus.

Value of this total, $\frac{33}{25}$ M $\times$ $(750 - \frac{750}{33})$ - - = 960 M
A's residue, 2250 $(3000 - 750)$ @ $\frac{1}{25}$ M - - = 90 M
Value of $\frac{750}{33}$ of B, C, D exchanged for 750 A @ $\frac{33}{25}$ M = 30 M

The 960 M surplus to B, C, D shows how the latter benefit from A's misfortune. 960 + 90 + 30, or 1080 M, is the sum that theoretically, in this case, could be appropriated to reimburse the capitalist, including interest. The surplus to B, C, D grows with the decline of A's value, till at the point of annihilation of that value the surplus reaches the limit, 1000 M.

In our example, 3000 A represents an increased productivity of that commodity in the ratio of $\frac{3}{2}$ (adding the equivalence, 1000 A, of the borrowed capital to the exclusive labor product, 1000). We have found that A may decline in unit value through a considerable range without losing its advantage over B, C, D. At $\frac{2}{3}$, as compared with the latter, the advantage is just overcome; but all the commodities at this point will show equal advances in aggregate value, enabling A still to pay interest. At the point where A's decline is to $\frac{8}{9}$ of the standard, which is equivalent to $\frac{8}{9}$ the value of B, C or D, A will just be enabled to restore the capital borrowed, and retain his own former product. But B, C, D's products will at the same time advance in the ratio $\frac{10}{9}$, which would enable the community, as a whole, without prejudice to their welfare, still to pay interest on A's borrowed capital. This condition of affairs will continue until the decline of A's unit value reaches the ratio $\frac{1}{2}$,[1] compared

[1] This rate, $\frac{1}{2}$, indicating the limit of decline in the value of A, compatible with interest resources, may be obtained algebraically, as follows:

Let x = the required ratio.

Then $\frac{x}{4}$ = the value of the quarter-unit of A in the standard, M.

$\left(1 - \frac{x}{4}\right)$ = the value of the three quarter-units of B, C, D in the standard, M.

$\left(1 - \frac{x}{4}\right) \div \frac{3}{4}$ = the value of one unit of B, C, or D = $\left(\frac{4}{3} - \frac{x}{3}\right)$.

$\left(\frac{4}{3} - \frac{x}{3}\right) \times 3000$ (the B, C, D product) = $(4000 - 1000x)$.

$x \times 3000$ (the A product) = $3000x$.

By hypothesis, the entire product, whose value is the sum of $(4000 - 1000x)$ and $3000x$, just discharges the debt of 1000 M, borrowed capital, while leaving the former product-value, 4000 M, intact. Hence the equation, $4000 - 1000x + 3000x = 5000$, which yields $x = \frac{1}{2}$.

with the standard, which is equivalent to $\frac{3}{7}$, compared with B, C or D. If the value should fall below $\frac{1}{2}$, the community as a whole is prejudiced by the use of the borrowed capital.[1] These deductions are based on the following computations:

A, at $\frac{2}{3}$ of B, C or D, when referred to the standard M, reduces to the relation, A, $\frac{8}{11}$; B, C, D, each, $\frac{12}{11}$. This relation satisfies the two conditions that A shall equal, in unit value, $\frac{2}{3}$ of B, C or D, and that one unit of each commodity shall together equal 4 M. $\frac{8}{11}=\frac{2}{3}$ of $\frac{12}{11}$ and $\frac{8}{11}+\frac{12}{11}+\frac{12}{11}+\frac{12}{11}=\frac{44}{11}=4$.

3000 B, C, D	@ $1\frac{1}{2}$ M	= $3272\frac{8}{11}$ M
3000 A	@ $\frac{8}{11}$ M	= $2181\frac{9}{11}$ M
Total		$5454\frac{6}{11}$ M
Deduct borrowed capital		1000 M
Balance		$4454\frac{6}{11}$ M

This shows a surplus to the community of $454\frac{6}{11}$ M. Deducting 1000 M for restored capital shows A's surplus to be $181\frac{9}{11}$ M. He is in a position to divide this surplus with the capitalist, in discharge of interest, and still show the same surplus as his companions, since $\frac{1}{2}$ of $181\frac{9}{11}=90\frac{10}{11}=\frac{1}{3}$ of $272\frac{8}{11}$, the aggregate surplus of B, C, D.

For A$=\frac{2}{3}$ the standard, or $\frac{3}{8}$ of B, C or D, we have the following result:

3000 B, C, D	@ $\frac{10}{9}$ M	= $3333\frac{1}{3}$ M
3000 A	@ $\frac{7}{4}$ M	= 2000 M

These figures show that A could just refund the capital, while B, C, D would be in a position to pay the interest for A and still maintain an advantage.

[1] It is only on the supposition of accumulated goods, extravagantly depreciating during the process of production, that we can find the conditions for a decline in aggregate value. In the case of the text, if we consider the last supposition, the capital, 1000 M, becomes transformed, economically speaking, into 1000 A and thus suffers with the entire product of A extravagant depreciation. Such circumstances could obtain in real life, as a rarity, perhaps, but cannot be taken into account in formulating general principles.

Even in this fanciful case, the community, A, B, C, D, could have thrown the burden of the capitalist by stipulating in the beginning that the loan should be negotiated in terms of A, and returnable in that commodity. This would have left the community a surplus, which would have carried an excess value as long as A retained any value whatever.

Lastly we may make the computation based on the relation, A=$\frac{1}{2}$ M, or $\frac{3}{7}$ of B, C or D:

3000 B, C, D - - - - - -	@ $\frac{7}{6}$ M =	3500 M
3000 A - - - - - -	@ $\frac{1}{2}$ M =	1500 M
Total - - - - - - - -		5000 M
Deduct capital - - - - - -		1000 M
Balance - - - - - - - -		4000 M

The course that A should pursue, under these circumstances, is plain. When the decline in unit value reaches a certain point, self-interest will suggest the restriction of his output, or, better still, the diverting of a part of his energies into more promising channels. If B, C, D should exercise like wisdom, their co-operation in extending production in all lines would obviate the unpleasant embarrassments that inevitably attend a decrease of utilities, and would greatly advance the general welfare of the community.

II.

The foregoing discussion is intended to show that value, aggregate real value, follows the quantitative movement of economic utilities, and is not the basic consideration in the problem of interest. This result may be reached from various points of view. Let us consider for a moment the question of interest without reference to the category of value. To do this it will merely be necessary to suppose every member of the community that produces the utilities that he himself consumes. If A, B, C, D be types of these utilities, a representative producer makes his own A, B, C, D, and there is no occasion for exchange, and, of course, no need for a mechanism to perform that office Suppose, under these circumstances, an enterprising capitalist appears on the scene. He goes over the situation, and proposes to these simple craftsmen to provide machines for them that will double their output, he to take, as remuneration, one half of the excess. The arrangement is effected. The capitalist finds that he has made a good investment, realizing all his expense with a handsome bonus. The community has paid capital and interest out

of the surplus product. The notion of value has not occurred to the members, at least, in any very definite way. They have effected no exchange, other than the exchange of consumption goods for the *use* of machines. From long habit, their circumstances are intelligible to them only in terms of utilities—the quantity of these. The inspiration to institute a system of measurement between their products and this radically dissimilar species of property belonging to the capitalist would hardly seize them in the earlier stages of their new experience. The machines have merely been entrusted to their care and use. The question of reimbursement has been one of division of their surplus product. Interest has been paid by them in the natural, simple way, out of the source and essence of all economic reward, utilities.[1]

III.

Supposing, in our illustration, a member of the community, A, B, C, D, possessing ingenuity, invents methods to increase the quantity of his product without working in the long run more hours than formerly. He is unquestionably better off than before, although the notion of value may be excluded from his thoughts or life, since exchange is not a part of either. He will consider himself well compensated for devoting a portion of his time to inventing new processes. Since exchange is not the order of the day, this citizen may be sufficiently philanthropic to share his discoveries with his neighbors, or the latter may be equally ingenious, and accordingly increase their product likewise. This is not the method of real life, but the object aimed at, namely, the increase of utilities, does not change with any alteration of the industrial mechanism. It is likely to be the case that the

[1] It will, of course, be claimed that the enterprising capitalist would push his advantage to the point of exacting nearly or quite the whole of the excess product for the use of the machines, and that the community would intuitively appraise the machines according to their efficiency, ignoring (in case they were aware of) the comparatively slight cost to the capitalist. No doubt time would bring about a certain measure of enlightenment, and in case of a single capitalist, the valuation would stand as just stated. The monopoly value would be at par with the efficiency. This point will be discussed presently in the text.

inventor will find his pleasure and profit in devoting himself to his inventions, and that the rest of the community will be more than satisfied to share their utilities with him, if he can furnish devices whereby all concerned will have increased quotas. In this case of simple barter, barter of utilities for implements or machines, we have a true case of valuation, valuation of consumption goods in terms of machines or *vice versa*. If we suppose it to be a primitive pioneer case, however, there is no danger that the category of value will so exclusively intrude itself on the attention of these simple traders, and so distort their vision as to blind them to the real significance of the transaction, namely the increased quantity of utilities. Value has as yet scarcely taken on perceptible form. If regarded at all, it is regarded only as an incident and, by no means, the end and consummation of this simple readjustment of industrial life.

Now, if we follow the interrelations of value and utilities, as manifested in the most highly developed mechanism of modern life, we must find the situation the same. We *must* find it the same, because the time never comes when consumption goods, or utilities cease to be the ultimate end of economic activity. Value, or valuation, comes to be more and more prominent and at last indispensable, simply because exchange involves valuation, and division of labor and segregation of industries necessitate exchange. But neither valuation, nor exchange, nor division of labor is an end to itself. The end of each and all collectively is increase of utilities. It is always for the sake of increased utilities that division of labor is resorted to, that exchange is resorted to, that valuation becomes the efficient and prominent expedient for the distribution of utilities, but only the expedient.

It therefore appears that increase of commodities, or utilities, involves normally increase of total value—that is, of real value, value according to the multiple standard. Indeed, conventional or money value, to be satisfactory, must not greatly offend this criterion. For transactions that do not involve time it would work no special injustice, although there might be great

inconvenience, for values to change haphazard; but for transactions involving time, it is very important that the unit values of one period conform closely to those of another. When change of value can be forecast, the change can be allowed for in the negotiation. Irving Fisher[1] has shown how interest moves up and down with the depreciation and appreciation of the standard. This phenomenon could not happen if money value were the ultimate consideration in exchange. It is an emphatic confirmation of the view that utilities are the fundamental determining factor. Indeed, public morals demand that money value, based on an arbitrary standard, keep closely in touch with the movements of utilities. If the standard changes rapidly and independently, deferred payments are attended with great injustice, as, witness the experience with inconvertible paper. And even in case of money of intrinsic value, the course of silver in late years shows the necessity of actually discarding a standard when its movements defy control or fore-casting.

IV.

If in our simple community, A, B, C, D, a single member makes the machines, it will be interesting to enquire the rate of exchange between machines and finished products. Let us suppose that to construct and keep in order one machine, or one set of machines, requires one fourth of the maker's time, so that the productivity of the machine must make up for this one fourth in a specific period, say the life of the machine. Let us suppose that in this three fourth's time, that the machine is in operation, its productivity makes up not only the one fourth but another one fourth in addition. And for the machine to furnish a profitable process there must be some additional productivity. Then since, by hypothesis, the machine has worked but three fourths time, the actual productivity of the machine is two thirds in excess of that of hand work, so that a purchaser using the machine full time realizes a product 66⅔ per cent. greater than formerly. Böhm-Bawerk's claim that the machine has the value of the

[1] "Appreciation and Interest." *Publications of the American Economic Association*, vol. xi.

excess product may be tested in this simple case. If there is but one maker of machines, and but one capable of making them, it is plain that he can command anywhere up to this two thirds product of hand work. The machine has cost him in time what is equivalent to one third of his own hand product, so that the limit of his natural gain is 100 per cent. It will fall some below this point, since the purchaser will rarely invest excepting under the stimulus of some prospective advantage. But it must be conceded that, in this case, the value of the machine has as its limit the excess value of the product. But this case supposes a strict monopoly. Supposing that all the members are capable of making machines, but that from choice the making of them is left to a few, or suppose that there is unrestricted competition in the making of machines. It is equally plain in this case that the value of the machine will approach the one third point instead of the two thirds point, that is, toward the point which represents the expenses of production. We can concede with Böhm-Bawerk that the product (value of the product, if you choose) determines the value of the machine, but only on the first supposition, namely, in the case of a strict monopoly. In the case of competition this doctrine of Böhm-Bawerk must be discarded. If a machine is sufficiently productive to increase the product above what could have been realized by the quantity of labor required to make the machine, it is a profitable investment, and in the average case will produce an excess value in the product above the value of itself, in case of free competition. The normal value of a machine, then, will range from the "expenses of production" as its lower limit, to the excess value of the product, as its upper limit. In the case of competition the quantity of product included between these points affords the basis of interest. It is plain that these circumstances obtain in the simple case cited, and, in the complicated relations of modern life, the same conditions persist.

V.

Probably the circumstance that gives color to the view that the surplus product controls and determines the value of the

capital is that in individual and sporadic instances, there is a great decrease of unit value following a sudden or considerable increase of the product. This is true of individual cases, but it is fallacious to infer that it is true as a rule. It cannot be true as a rule. For instance, supposing A, B, C, D expand their product to fourfold, through the use of capital. Supposing the capital employed in each case is 1000 M, and that the unit values of A and B drop one half. The values[1] of C and D must at the same time advance, on the average, one half, for

Two units of A and B @ ½ M = 1 M
Two units of C and D @ 1½ M = 3 M

making four units = 4 M. That is to say there can be no decline without a corresponding advance. The average remains the same. If certain articles decline in unit value, from whatever cause, other articles will necessarily advance, making the average total value of a commodity increase or decrease with a corresponding movement of the product.

On the average, then, increased product of a commodity must yield increased aggregate value. This is the law of the average, and interest is a question of average. Individual borrowers must pay interest whether their investments are profitable or unprofitable. The average case, owing to the average productivity of capital, has been, as a matter of fact, profitable, which has furnished, not the pretext merely, but the justification of interest.

VI.

If a man produces a certain product by his own labor, it is certainly competent for him to equate the values of the labor and the product. This is a subjective valuation, simple and correct. His labor is his own, his product is his own; the one produced the other. There is no way for him to value his labor but in terms of the product, or its value. If this same man makes a machine that enables him to double his product, this excess product is likewise his valuation of his machine. His unassisted

[1] See p. 62.

labor has given him a single product; his machine[1] has enabled him to double the product. There is no more natural or just mental process than to assign the entire value of the product to the two factors, and in the proportion as indicated by the above analysis. It is a case of pure subjective valuation.

Now let the man go out into the market and hire labor. He pays the market price. The value of the labor is fixed. It is true that the prospective product may indirectly influence the price of the labor. It is fair to assume that the prospective product will have some quantitative relation to similar products of the past. But, at best, this is but one among a number of determining forces. If labor is abundant, competition will depress its price, despite the enhanced value of the product, and *vice versa*. Now, if the value of the hired laborer's product is twice his wages, the difference is pure gain. The great value of the product does not correspondingly enhance the value of the labor. Had the employer been unfortunate, obliged to sell the product for half the wages, this circumstance would not have depressed the latter. Of course, it is the average case with which we are concerned; and the average case must yield a surplus, or there would be no inducement to hire.

The case is the same with capital. If a man purchases a machine, and thereby realizes twice the cost of the machine, or 25 per cent. in excess of that cost, this circumstance does not determine the price of his purchase. It may, as in the case of labor, be one of a group of factors that determine that price, but the excess value of the product is gain from which interest can be appropriated, in case the capital is borrowed. The point is that here the analogy between labor and capital is perfect. The objective value in each case is determined in the market — both the value of labor and that of labor's assistant, the machine. The product determines the value in the one case no more than in the other.

VII.

What rôle does value play in the interest problem? In relation to the agencies which we have been considering, labor,

[1] The time for making the machine is not considered here.

capital, production, exchange, interest, etc., value is an effect and not a cause. We have seen that the industrial processes could go on without requiring the formality of valuation or indeed the conception of value. However the great impetus to industry which division of labor and exchange lend, by means of the facility with which the various processes are carried on, exalts value to an important and conspicuous rank in the hierarchy of economic concepts. But, after all, value, in our problem, has only vicarious or representative importance. Back of value we find the thing of real importance, the utility which value interprets and represents. Interest can be a question of conventional value, only when the latter gives a true interpretation, just as the register of the thermometer can be a true index of heat phenomena, only in case the registration is true. If the registration is false, it gives a false reading of the phenomena it professes to interpret. The water does not boil in obedience to the registration. Rather must the registration be adjusted to a correct interpretation of the phenomena. It is even so with value. The registration must be adjusted to the phenomena of economic life, in the field of distribution, and not *vice versa*.

Value is merely a relation. It arises in modern life out of the process of partition of utilities, or commodities, into the various shares of wages, profits, interest, etc. These shares have real serviceable content, and may exist actually, and always do exist logically, prior to the concept, value, which merely co-ordinates and interprets them quantitatively. Value, being a relation, cannot create so important an entity as interest, which is indeed one of the substantial categories related. A formula, or category of relation, cannot create the things related. Value is not *the*, or *a*, cause of the shares of the product. It serves, in the realm of distribution, as the language, or the quantitative interpreter, of these shares, rather than the active agent to produce them. Value is the mirror through which is seen the quantitative relation of the shares, rather then the creator of any share. If, by reason of a grave fault in the standard, the conventional value

speaks a seriously imperfect language, or shows a badly distorted image, a drastic remedy must be applied—a change of the standard. The rôle that value plays in the problem of interest is not fundamental, though important. It is conspicuous, but not essential. It is interpretative, but not creative.

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CREDIT-CURRENCY AND POPULATION.

In this Journal for March 1895 the writer of the present article presented some results of an inquiry made by the comptroller of the currency,[1] concerning the proportion of credit-paper used in retail payments. An attempt was made to formulate a relation between population and proportion of credit-paper used. The data were so meager that the attempt seemed over-bold, and the conclusions but slenderly supported. Two years later a second set of data was secured, much more voluminous and more representative of the habits of the people in the use of credit-paper. Although the new data seemed to support the previous conclusions, they could in no sense be regarded as proving them, and it was a question whether it was worth while to present the new evidence. Further reflection, however, strengthens the writer's belief in the probable correctness of his first conclusions. This, together with the importance of the subject, must serve as his excuse for taking up the matter anew.

The data obtained for these reports contained, among other things, a statement of the amount of deposits made in the banks which replied, on a selected day, together with the amount of these deposits made in the form of credit-paper.[2] The returns dealt separately with the returns of retail traders, wholesale traders, and "all others." The primary purpose of getting the data was to determine the extent to which credit-paper was used in payments.

Obviously, if there is a definite relation between increasing population and the quantity of credit-paper it uses, a definite line could be drawn to represent this relation, using the population numbers as points on the axis of abscissas and the corresponding amounts, or proportions, of credit-paper to indicate the values of the corresponding ordinates. Is it possible to use the data secured so as to show this, even in the roughest way? To get a true curve of such a relationship, if it exists, there are certain conditions necessary, whose importance is emphasized, if one may say so, by their absence from the statistics at hand. The

[1] See the *Comptroller's Report*, 1894 and 1896.

[2] I have given elsewhere my reasons for believing that the information secured in these reports fairly shows the extent to which credit-paper is ordinarily used in payments in the United States. See the *Comptroller's Report* for 1896.

different cities and towns should present a gradual and equable increase in population. That is, in order to yield a line that could be properly called a curve, each place should have a population larger by a constant amount than that of the one preceding it. But population does not distribute itself in so accommodating a fashion! The best we can do is to group the places from which answers came, according to size, at intervals of, say five thousand, and to take the average of the population of the places in each group as points on our axis of abscissas; and the percentages of the corresponding averages of deposits and checks for our ordinates. These averages will not give true points on the curve, but they will be approximately correct, the more so the larger the number of places in each five thousand interval, and the more nearly equal the population of the places in each group. One source of error in connection with population was the necessity of taking the figures of the census of 1890 when they were five or six years old. The use of these figures involves, of course, the assumption that the different places have the same relative positions in the scale of population that they had six years previously. This cannot be true, but as the error runs throughout our table and probably does not vary greatly between different population groups, it can hardly be of serious importance in a set of statistics so rough as those with which we have to deal.

A second condition necessary to the success of our plan is the provision of some means to offset influences due to differences in the economic character of the places grouped together. Where the number of places in a group is considerable, we may safely assume that this result is attained by the diversity which a large number of places is likely to present. Where the number is small, or even only one, we may still have a correct result, for the industrial life of the population may be so varied as to be representative. Whether or not this is so in a given case must be determined by our knowledge of the place, or places, from which the percentage is derived.

Again, since our data deal with the percentages of credit paper, we need to know if the habit of using such paper prevails throughout the country to substantially the same extent, or if differences in this respect neutralize one another. In the second report on this matter to the comptroller of the currency, attention was called to differences in what we may, for brevity, call the check habit in retail payments, arising out of differences of nationality, education, etc. These differences,

however, are not of very great magnitude, and disappear largely in our grouping of different places. For single places we can make some allowance for them.

Further, we must assume for our purposes that volume of business or of payments is approximately proportional to population. This is not a violent assumption for *retail trade*. There are other conditions which must be satisfied by any statistics that purport to give us information about the subject of our inquiry; but the discussion of these, as well as the further consideration of some we have mentioned, can better be taken up in connection with our data.

The data that we have, and any that we are likely to get, are evidently far from meeting the exact requirements of statistics that would reveal the law we are seeking, if such a law exists at all. To put the matter bluntly, we have a set of figures which are not directly applicable to our purpose and are so full of errors that the use of them as they stand would be sure to lead us far astray. Is it possible to use them indirectly to suit our purpose? Can we so adjust and allow for at least the evident errors as to neutralize them partly or wholly? Our aim is one of so much interest and importance that the trial is worth while. And mathematicians and statisticians, at least, do not need to be told that out of data of such character it is sometimes possible to get suggestions, indications, that point the way to truths which the figures cannot establish, or even fully express.

The investigations referred to produced two sets of data. The statistics obtained in 1894 refer only to retail trade and were much less complete than those secured in 1896. The former show the total receipts made in national banks in the United States on the "settlement day" following the 1st of July, by retail tradesmen of sundry kinds, and the amount of these receipts in the form of credit-paper of various kinds. In using the data for the present purpose the returns were arranged[1] so as to show the percentages of checks in the bank deposits by population groups. These groups, however, were not averaged. Various refinements of the statistics were then made showing the percentage of increase of total deposits and of checks for successive population groups, and the ratio between the two. But there were so many sources of error, and the data were so meager, that these refinements were gratuitous. If the data could be regarded as furnishing any indication of a law, it was "exceedingly remote; so much so,

[1] See this JOURNAL, March 1895.

indeed, that if we consider them by themselves we cannot be sure that they mean anything."[1] Such as the figures were, however, they are given herewith:

PER CENT. OF CHECKS USED, BY POPULATION GROUPS OF 5,000 EACH, FROM ALL RETURNS.

Population	Per cent. checks	Figures from which per cents. were calculated		Per cent. of increase of totals, group to group.	Per cent. of increase of checks, group to group	Ratio of per cent. increase of checks to that of totals (latter taken constant)
		Total returns	Total checks			
1,000– 5,000	59.1	1,494,159	883,134	....	....	.....
5,000–10,000	55.5	839,950	466,229	−56.2	−52.8	0.940
10,000–15,000	59.0	732,433	433,145	−87.2	−92.9	1.060
15,000–20,000	60.6	265,598	160,902	−36.2	−37.1	1.024
20,000–25,000	62.2	364,481	226,687	137.2	140.9	1.027
25,000–30,000	52.5	117,290	61,573	−32.1	−27.1	0.840
30,000–35,000	52.0	71,746	37,254	−61.1	−60.4	0.990
35,000–40,000	47.1	104,870	49,483	146.2	132.7	0.910
40,000–45,000	54.7	156,249	85,460	148.9	173.1	1.160
45,000–50,000	49.1	61,824	30,358	−39.6	−35.5	0.890
50,000–55,000	62.6	78,971	49,454	127.9	162.9	1.270
55,000–60,000	54.8	105,611	57,866	133.7	117.0	0.870
60,000–65,000	48.5	36,981	17,937	−35.0	−30.9	0.880
65,000–70,000	....	.....	.....	.....	.....	.....
70,000–75,000	32.3	29,116	9,396	.....	.....	.....
75,000–80,000	61.9	86,535	53,542	297.2	569.7	1.920
80,000–85,000	46.1	46,521	21,453	−53.8	−40.1	0.740
85,000–90,000	62.2	22,334	13,870	−48.0	−64.5	1.340

If we plot the line to represent the percentages of checks,[2] it shows a rough periodicity. The last column of the table was worked out to see whether it would give any clearer indication of the relation of the successive maximum and minimum points; but an inference can hardly be drawn from the figures, unsupported by other considerations.

On the whole, however, the data seemed to the writer to furnish some faint indications of the existence of a relation, and it was of considerable interest to secure a more complete set of statistics. An independent study of fuller data might throw more light on the matter, whether confirmatory or destructive of these indications. Such

[1] *Ibid*, p. 212.

[2] Since the averages of the population groups were not found, it is necessary to take equal distances on the x co-ordinate. This, of course, causes error. The percentages do not correspond to places differing by exactly 5,000 population. But this will not affect the general character of what we may by courtesy call the curve.

data were obtained in the inquiry made in 1896. The banks of the country were then requested to furnish their total deposits on a given day, stating separately the amounts of money and of credit-paper deposits, and distinguishing the deposits of wholesale business from those of retail, and both from the deposits of all other depositors.[1]

For our present purpose we use, as has been said already, only the statistics relating to the deposits of retail tradesmen. For the previous figures concerned only this class of business, and these statistics must represent, more fully and correctly than the others, the daily habits of the people in the use of various media of payment. The proportion of wholesale business settled by means of credit-paper is everywhere very large, and pretty nearly constant. In the figures for retail business not only are the operations of a larger number of people represented, but the variations in the use of credit-paper are much greater. Hence we can follow any indicated tendency more easily, and have more room to allow for miscellaneous causes of variation. The figures for retail trade are better for our purpose, moroever, than are those representing the deposits of "all other" classes. These latter probably represent a smaller class of the population, and very likely include more long-time payments. Moreover, the people represented are already represented in the figures of deposits for retail trade.

The following table gives the data secured concerning retail deposits. The first column shows the averages of the population of places from which information was received, at intervals of five thousand; the second column gives the number of places represented in each population average; the third, the number of banks, etc.

It is necessary here to consider a little more carefully the limitations under which these figures must be used. The larger the number of places represented in a given population group, the more likely are the data correctly to reveal the relation between population and proportion of credit-paper, if such relation exists. For, as has already been urged, we have in each group places approximately alike in population, but different in economic character, in the degree of development of the "check habit," and in other respects which affect the proportion of credit currency used. We may fairly assume that

[1] The representation and analysis of the data secured will be found in the *Report of the Comptroller of the Currency*, 1896, together with my opinion as to the real significance of the figures. *Cf.* also, JOURNAL OF POLITICAL ECONOMY for March 1897.

TABLE I.

	Averages of population	No. of places	No. of banks	Checks, etc.	Total deposits	Per cent. checks
1	1,648	2,675	3,309	$3,697,317	$5,627,696	66
2	7,915	278	564	1,520,659	2,437,509	62
3	13,096	94	220	710,547	1,128,251	63
4	18,186	50	175	611,529	934,846	65
5	22,418	37	125	487,125	800,879	61
6	28,290	20	71	228,443	395,310	58
7	33,456	12	63	166,170	285,143	58
8	33,312	13	52	230,326	383,010	60
9	43,611	9	46	222,246	361,239	62
10	48,785	7	44	192,596	321,768	60
11	54,078	5	29	85,118	149,981	57
12	59,133	5	34	267,056	395,230	68
13	63,170	4	21	106,698	177,514	60
14	70,028	1	7	17,179	28,534	60
15	74,806	2	15	61,765	143,472	43
16	77,404	3	15	98,919	189,173	52
17	82,426	3	24	80,997	183,891	44
18	88,146	2	21	103,867	167,357	62
19	94,923	1	11	48,797	70,144	69
20	105,361	2	8	99,027	145,382	68
21	106,713	1	4	425,447	535,978	79
22	132,973	4	53	670,979	870,383	77
23	140,452	1	8	31,971	59,885	53
24	162,957	3	24	352,325	451,733	78
25	181,830	1	9	159,506	230,664	69
26	205,172	2	20	203,124	290,193	70
27	225,664	1	17	132,569	206,600	64
28	230,392	1	12	93,185	155,696	60
29	238,617	1	45	203,906	344,350	59
30	242,039	1	10	117,480	155,315	69
31	261,353	1	21	372,036	470,132	79
32	297,952	2	26	302,807	459,300	66
33	434,439	1	25	220,232	376,606	58
34	448,477	1	62	817,463	1,086,732	75
35	451,770	1	17	539,932	655,804	82
36	806,343	1	22	548,057	729,100	75
37	1,046,964	1	66	1,136,193	1,445,885	78
38	1,099,350	1	36	689,936	960,647	72
39	1,515,301	1	70	1,696,907	2,136,816	79

the percentage of checks in any group, if it includes a goodly number of places, is nearly such as would be used in a place of the size of the group, in which differences in industrial character, in the "check habit," and in other material respects, were present in the proportions in which they really exist in our country.

The population groups of the table approximate more or less closely to the type, according to the number of places represented. Of course, a group of a small number of places may also be typical.

We cannot say what the minimum number may be. Further, the amounts of business in such *typical* groups, *on a common average of prices*, would be proportionate to their numbers. The various industries are carried on by workmen of the same average ability, with similar tools, and under similar conditions. Of course, no one population center, no city, town, or village, of this typical character exists. But every place with a considerable diversity of industry approaches the type, the more so the more nearly its industries in number, volume, and character are representative of the industries of the country at large. If the number of banks represented is large, for a group in which the number of places is also large, the probability of the accuracy of the data secured is obviously increased, provided there is no reason to think that the distribution of the banks is bad. If, however, the number of banks which furnished data for a population group is large, while the number of places is small, there is possibility of serious error. The peculiarities of a place will be exaggerated the larger the number of its banks. If the data in any instance are bad from this cause, they will be, like the little girl in the story, very bad. In the one or two instances in which this occurs, however, we may be able to find means to make allowance for this disturbing cause.

One other difficulty lies in the fact that the deposits from which the percentages are drawn represent a larger amount of business than the retail payments of a day would amount to. As the writer has pointed out elsewhere,[1] this excess may mean either that the deposits of credit-paper included payments of accounts of some standing, or that retail purchases keep ahead of consumption by so much. The latter is the better explanation, because, so far as investigated, the proportion of credit-paper in deposits did not vary materially from day to day for a month.[2] But whatever view is taken of the cause, if the excess of payments over consumption were in the same proportion in all cases, the *relative* variations of the credit-paper percentages would not be affected. This constancy cannot be expected, however. Hence, we must expect irregularities from this source, and cannot correct them.

Turning now to the table, we find a succession of alternate high and low percentages, but at intervals by no means regular. We can follow the course of the figures more easily if we plot them. We get

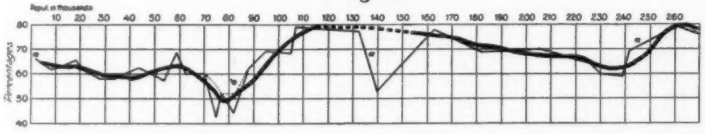
[1] See *Report of the Comptroller of the Currency*, 1896, and this JOURNAL for March 1897.

[2] See *Report of the Comptroller of the Currency*, 1896, p. 85.

the line *a* of diagram I, through the point representing the population group of 261,000. Beyond that the points are too widely separated to permit the drawing of a continuous line. The thick line is simply a free representation of the general course of the curve.

The points on the axis of *x* are at fairly regular intervals of approximately 5,000 up to the twenty-fourth place, of 163,000. From this point to the thirty-second place (297,952) the intervals are longer, but sufficiently numerous to give the general trend of the curve, as, for brevity, we shall call it. Beyond this, especially between the thirty-fifth and thirty-sixth places, the intervals are too great to give us any reliable indications. Leaving for the present the discussion of details and corrections, let us first look at the curve as a whole.

Diagram I



An examination shows that up to the 260,000 point it consists of at least two great waves, each of which is made up of a series of smaller waves. The first great sweep extends to the group whose population is somewhere between 100,000 and 160,000. The points on the wave are numerous enough, up to 100,000, to justify us in thinking we have its general course fairly well determined. Of its course between this point and 160,000 we cannot be so sure. At 106,713[1] we have the percentage 79. But it is derived from the returns of Denver alone, and is doubtless too high. Four banks are represented, and the average per capita deposit is $5.00. The percentage cannot be representative. At 132,978 we have a percentage of 77, from 53 banks, in 4 places. At 162,957 we have 3 places and 24 banks represented, yielding a percentage of 78. It seems certain that between 105,361 and 162,957 we are in a region of high percentages. This is said in spite of the depression at point 140,452. The percentage here is given by Omaha alone, the returns of 8 banks being included. It cannot be typical, for Omaha is economically peculiar. Moreover, we know now that Omaha does not belong

[1] The groups 105,361 and 106,713 represent different 5,000 intervals. For this reason they are not combined, though so close. Moreover, the latter is so abnormal that a combination would be colored almost exclusively by it.

at this place in the population schedule. If we put it where it belongs, after the eighteenth place, its percentage would harmonize more with the others. On the whole, the evidence seems to justify us in concluding that the first great sweep of the curve ends in a high point somewhere between 130,000 and 160,000. From here on we have a second great sweep of similar character, apparently ending in the neighborhood of the 260,000 point. Beyond this the data are too meager to give a continuous line. There appears to be a depression between 300,000 and 430,000, and a high point somewhere beyond 450,000.

If we draw[1] the first two sections of the curve on the same scale, under each other as in Diagram II, we notice at once a striking similarity of general character. The heavy lines are approximate average lines drawn to bring out the similarity. Each section shows a gradual decline for about two-thirds of its distance, and then a sudden rise. The maximum and the minimum points of the second section are higher than those of the first. The group of percentages towards the end of our table averages higher than anywhere else.

The great depressions in the two sections represent the returns of cities,[2] several of which have an industrial character that leads us to look for a low percentage of checks. We are not here concerned with the question whether there is a connection between size and economic character of communities. It may be that a certain economic life is associated with a population of a certain number, or of multiples of that number. That is a question for the sociologist, and his data for answering it are meager enough. Here we can simply note the facts that the industrial population predominates at these points, and that our percentages of credit-paper, therefore, fell away.

Let us turn now to a somewhat more detailed examination of one of the sections of the curve. Since the points are most numerous in the first section, it is this that will best serve for our study. The curve is tolerably smooth through the first eleven points furnished by the figures. The table shows that each of these points is determined by a number of places in no case less than 5, and a number of banks

[1] The thin lines *a* and *c* are plotted from the figures, *a* representing the first section, up to 95,000; *c* representing the second section, from 163,000 to 260,000. Line *a* has been smoothed out as described later.

[2] Fall River and Scranton are in the first section; Toledo, Worcester, and New Haven in the second.

in no case less than 29. The percentage of checks (66) for the places below 5,000, is probably too high, because the deposits in the small agricultural districts very likely include a disproportionate amount of time accounts. But we have no means of testing this supposition, and must use the figures as they stand. No reason appears for questioning the representative character of the other percentages in the first eleven places. The sudden rise at the twelfth place is due mainly to Trenton, N. J., and Portland, Ore. But the business character of Portland is peculiar, and Trenton is possibly largely influenced by New York and Philadelphia. The percentage is probably too high.[1] But we have, again, no means of correction. The important thing is that hereabouts we find, or seem to find, the turning point of an upward movement.

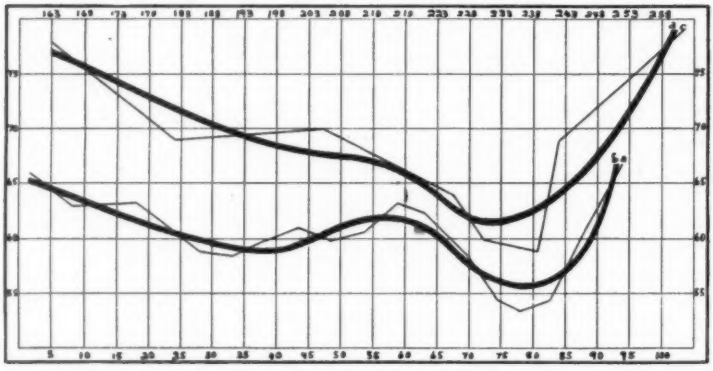
At the fifteenth place the line marks a sudden and great dip, and immediately rises again. It falls from 60 to 43, and then rises to 52. The two cities which yield the average 43 are Fall River and Scranton. The former is a textile manufacturing city; the latter a mining city. A large proportion of the population of each is of foreign extraction. These facts lead us to expect a percentage of checks below the average,[2] but 43 seems too low. For, curiously enough, the low average is due to the *national* banks of Fall River. Without their $72,083 deposits and $22,783 checks, the percentage would be 55, a figure which seems more like what we should expect in an average group of the size and character of the fifteenth. This statement is supported by the fact that if we combine the returns of the group above with those of that below (14 and 16) the one under discussion, we get a percentage of 53 for an average population of 75,560. We may fairly replace the percentage of the table, 43, with 55. The seventeenth percentage also seems too low. The cities included are Toledo, Worcester, Mass., and New Haven, Conn. If we omit Toledo, the percentage becomes 52; and if we derive an average from a combination of the preceding and the succeeding group, we get 56. We will replace our 44 with 52. In any case, it seems that we are here in a region of low percentages. The twenty-first and twenty-third groups have already been discussed. Doubtless 79 is too large for the former, and 53 too small for the latter. We

[1] The other places in the group are: Lincoln, Neb.; Reading, Pa.; and Lynn, Mass.

[2] See the *Report of the Comptroller of the Currency*, 1896, p. 82.

have no means of verifying or correcting the figures, and we will omit these points in this connection. If, now, we make the changes suggested at the fifteenth and seventeenth places, and replace the original figures with what we will call, for brevity's sake, the corrected figures, our curve changes in these places as shown in line *b* of Diagram I. In order to bring out its character more clearly, we will smooth it out by one of the processes known to mathematicians, and it becomes line *a* of Diagram II.[1]

DIAGRAM II



Inspection shows a succession of high and low points at fairly regular intervals. We find elevations and depressions at those places which are removed from preceding high points or low points, respectively, by about twelve or thirteen population groups of 5,000 each. That is, elevations succeed one another at intervals of about 20,000. Thus there are elevations at the beginning, at 18,000, 40,000, 60,000, and 90,000. Beyond this the curve is not detailed enough for these lesser observations.

[1] We weight the values of x, using the formula,

$$y_r = \frac{(x_{r+1} - x_r)(y_{r-1} + y_r) + (x_r - x_{r-1})(y_r + y_{r+1}}{2(x_{r+1} - x_{r-1})}.$$

The percentages become:

1.	[66]	5.	61.6	9.	61	13.	62.6	17.	54.3	21.	....
2.	63.1	6.	58.7	10.	59.8	14.	58.5	18.	60.9	22.	77
3.	63.2	7.	58.5	11.	60.5	15.	54.6	19.	66.7	23.	....
4.	63.4	8.	59.9	12.	63.3	16.	53.6	20.	70.6	24.	78

It would be useless to try to read finer details in our data or our diagram. The last curve is as detailed a representation as we can hope for of the course of percentages, and it is from the character of this curve and the general trend of the grand sweeps that we may draw inferences. For convenience, we may here summarize the observations made:

1. The curve as a whole seems to contain two large sweeps, or sections, similar to one another. Each section shows a gradual descent to its depression, and then a more rapid rise to its end. The general level of the second large wave is higher than that of the first, and the curve as a whole shows a gradual ascent.

2. Each large wave is itself made up of a series of waves of lesser amplitude, showing a rough periodicity.

3. The curve appears to rise less rapidly in its later stage than in its earlier. Its rate of departure from the horizontal appears to lessen as it progresses. This tendency is not very marked, yet it is sufficiently evident.

What, now do these features mean? Like the physiologist, we have traced on a lampblack surface our line of social pulse-beats. What facts of life can we read in it? With full sense of the danger of making mistakes, and remembering the limitations of our data[1] we may venture to interpret the characteristics of our curve in the following law:

1. The proportion of credit-paper in the existing medium of payment, or exchange, increases on the whole, as a population grows.

2. After a community has reached a certain size, or a certain density of population, the *rate* of increase in the proportion of credit paper in the medium of exchange, decreases.

3. This increase, however, is not regular and steady, but broken and in some degree periodic. The progress is by leaps. These leaps are not a simple series. A growth of population over a considerable period shows a gradually falling use of credit-paper for a time, then a somewhat rapid increase. But within this large population unit are smaller units, each of which shows a variation of its own.

4. The actual proportion of credit-paper varies according to the industrial character of a community; but there seems reason for

[1] Especially that we are dealing with *retail* payments, and the assumptions (1) that these represent correctly the varying demand for medium of payment, and (2) that the volume of (retail) business varies closely as population.

thinking that the *relation* between growing population and demand for credit-paper is independent of industrial character.

The way we have been following is broken and faint and dubious. Were our figures all we had to rely on, we might hesitate to say that they tell us anything beyond the unrelated facts that such and such were the amounts and character of the bank deposits at the time selected. Even were our statistics full, even did they fall into unbroken line and regular relation, we might hesitate to believe the story they seem to tell, unless we could see some reason *why* it should be true. Statistics do not show causes, but facts. They tell us what is, not why it is. They are a tool of the scientific positivist. If we cannot see the rationale of a set of statistical data, we do well to insist on repeated presentations of them under different conditions, before we accept the empirical conclusions which they set forth. But the inferences from a single collection of data, even if they are imperfect, may be accepted if they are sufficiently supported by *a priori* reasons, if we have other grounds for believing in their probability. If we can say, there are such and such reasons why this must be so, we strengthen the case immensely.

How is it with our data? They are both meager and unrepeated. But the inferences which we have drawn from them are supported by reasons founded on well-known facts of economic life. We must emphasize anew the point that we are dealing with communities in which the use of credit-paper for making payments is common; in which the credit habit, as we have called it, is well established. Such a community has a choice of means of payment, and no *a priori* prejudice in favor of any one. The choice depends altogether on comparative ease and convenience; and the community instinctively adopts the means which are, on the whole, least costly[1]. That this is the case with the ordinary American community is a fact which hardly needs proof; and it is becoming more true of every community, the world over, as the industrial and mercantile spirit becomes more intense and competition supersedes custom in economic affairs.

Premising this, we turn to ask what *a priori* support we find for the inference that the proportion of credit-paper in payments rises for a period of large increase of population. Our premise suggests a

[1] This statement does not contradict President Hadley's, that a community uses a dearer money material as it rises in the scale of economic life. (*Economics*, p. 184) The dearer material is, however, the more efficient and therefore the less costly.

reason at once. The credit habit being well established, the growth of population and business is accompanied with an extension and refinement of credit machinery, which render possible a more than proportionate increase in the use of credit-paper. As in other economic relations, larger, more powerful and more delicate instruments pay only where the demand for their products is large, so credit machinery of given size and fineness needs a certain population for its most efficient service. Increasing population means, moreover, greater density and greater solidarity, greater complexity of business relations and extended economic interdependence. These changes broaden and deepen the mutual knowledge and confidence which form the basis of all credit transactions. They thus stimulate the growth of credit while at the same time they render credit payments easier and cheaper by improving means of communication and transportation.

The increase in the efficiency of existing credit machinery cannot be secured indefinitely, however. There is a limit to its refinement, and the rate of increase of credit payments must ultimately decrease. The first argument to prove this "slowing up" of the increase of credit-paper in payments is found in the necessities of mathematical theory. The percentage of credit-paper in the medium of payment cannot exceed 100; but the population of the group to which the highest percentage belongs may be many hundred or thousandfold the smallest group. To speak algebraically, the value of y in the curve cannot exceed 100; that of x may be indefinitely large. Hence, the curve must tend to become parallel to the axis of x. In the second place, the necessity of mathematical theory is supported by that of practical economic life. As population grows, the proportion of people of small incomes increases. But the small incomes mean purchases of small amounts at a time and, therefore, less use for banking. If retail trade is much subdivided and numerous retail shops are scattered throughout the community, the habit of making small and frequent purchases is stimulated. People do not buy ahead more than they must. In Germany, for example, where retail shops of every kind are found in nearly every block of houses, and sell quantities of their wares that to Americans seem ridiculously small, no housekeeper need buy necessaries in amounts that exceed the needs of half a day, at most. The ease of buying at any moment just what is needed promotes small and frequent purchases, and stimulates ready money payments. What influence "department stores" will have on this habit is an interesting question.

There is, too, a growing tendency to shorten the period of payment of wages and salaries. Hence the recipients get smaller sums at a time and the disbursement of money is less difficult. Many who bought on credit when the wage, or salary, period was a month, or a quarter year, will buy for cash when the period is only a week; and the payments being smaller, money is more convenient than checks. This greater use of money as incomes become smaller, or are more frequently paid, is a matter concerning which it is very difficult to get any direct evidence. From one source, however, we get a little light. The smaller purchases and payments necessitate a greater use of money of the lower denominations. Now there is some evidence that the proportion of these denominations becomes greater as population grows. Mr. J. B. Martin, writing of the circulation of Bank of England notes between 1844 and 1878, remarks:

> There is no material alteration in the demand for bank notes of intermediate values, but in the case of those of the highest and lowest denominations the change is very remarkable. The circulation of £5 notes here is seen to have doubled itself in actual volume, and to have risen 12 per cent. in its ratio to the total circulation, while the circulation of £1,000 notes has diminished by more than half in actual volume, and 12 per cent. in its ratio to the total circulation. . . . . There can be but little doubt that the increase of banking facilities has tended to the settlement of all but very small accounts by check, but the increase of population, the greater amount of business done, and, I hope we may add, the greater prosperity of the masses, have caused a still more rapidly increasing number of these small accounts to demand their settlement by bank notes.[1]

Similar evidence could doubtless be produced from the history of our own currency. Support of our thesis is found, thirdly, in the method of settlement of clearing-house balances. In New York, for example, money is used to a larger extent for this purpose than in many smaller places. At the time when statistics concerning credit-paper in deposits were secured, the statistics of clearing-house operations were asked for, including the method of settling balances. The returns show[2] that a larger proportion of the balance was paid in money in New York city than in most of the smaller cities. New York used $2,971,000 in United States notes, and $3,950,000 in United States currency certificates to settle her balance of $6,921,000 on the day in question.

[1] *Journal of the Institute of Bankers*, vol. i. p. 288.

[2] See the *Report of the Comptroller of the Currency*, 1896, p. 97.

Atlanta, Denver, Louisville, and many other places paid their clearing-house balances entirely by manager's checks. Yet it is in New York city that credit machinery is most delicate and extended. The explanation is very simple. The more complex and delicate the credit machinery the larger the ***minimum*** debt which it will pay to discharge through it. In a small place, with a single bank, whose bookkeeping is simple and whose office expenses are small, it may pay to handle checks for so small an amount as a dollar, or even 50 cents. There is no clearing house to go through, no duplication of transfers and other records. The case is quite different in the great credit centers. The credit machinery of New York is too costly to use on sums so small. It is easier and less expensive to make such payments in money. And we cannot insist too strongly on the point that a commercial community will always choose the least expensive method of payment. Another bit of evidence is found, perhaps, in the diminution of the percentage of credit-paper in bank deposits for the United States since 1881.[1] The writer has criticised the opinion that this falling off has been taken to mean a permanent diminution of the use of credit. We probably find the true explanation in the thesis we are now discussing. We may have been passing through the depression of a wave of our curve.

Interesting as are the first two conclusions drawn from our statistics, it is the third which is, perhaps, most remarkable. This is, that the growth of the use of credit paper in payments has a periodic character. Are there any logical reasons in support of the statistical evidence? Or must we look upon the upward and downward course of the curve as a curious incident, an accident of these particular data, and of no significance? We must emphasize anew our general principle, that when a community has a choice of means of payment, it will select the mode, or combination of modes, that is least costly. Let us suppose the case of a community of given size and volume of business. Its paying medium consists of money and credit-paper. There is a certain amount of ready money directly used, a certain amount used as a basis for the emission of credit-paper, and a certain amount of credit-paper is actually used from day to day. Population and business may increase, for a time, without making necessary an increase in the amount of money used directly, or to support the credit system. The existing money basis may be made to serve, for a time,

[1] See this JOURNAL, March 1897, p. 173.

as basis for an extended credit, by using a more refined credit system, a more complex and delicate credit machinery. Ultimately, however, the need for still more paying medium must be supplied in some other way.

Moreover, there comes a time in the growth of a community, when the difficulty of using credit payments between its center and its outskirts is as great as it was between two nearer neighborhoods, before the population became large and dense enough to admit of a highly developed credit system; and the expense of such a credit system in the thinly settled portions of the community is too great to justify its maintenance. It is cheaper to use more ready money. There comes a time, too, as we have seen, when there occurs a rise in the minimum amount for which it pays to use the existing credit machinery. This minimum can be reduced again only by an extension of the credit machinery through the investment of new capital. But before this is done, a period elapses during which it is cheaper to use more ready money. The money can be obtained in just the amount needed, while the minimum amount of capital that it would pay to invest in credit machinery would produce a larger extension of the system than the situation demanded. When the amount of a certain kind of work is small, we do it by hand labor; when it is large, we use machinery. When our need for goods is small, we buy at retail; when it is large, we buy at wholesale. So when our need for more paying medium is small, we buy it as we need it — in the shape of ready money; when our need is large, we supply it, and anticipate further needs, by new investment of capital in extending the credit system. When demand for medium of payment presses on supply, the sequence of development is, then: first, the refinement of the existing credit machinery to its maximum efficiency, then a period during which it is less costly to supply the new demand by means of ready money, and, third, the expansion of the credit machinery by the investment of new capital. Of course, these stages of growth are not in fact distinct. Doubtless the money supply may increase, and the credit machinery be both refined and enlarged simultaneously.

There must, consequently, be a fluctuation, an alternate expansion of the circulating money part and of the credit part, of the medium of exchange. But this alternation is not simple. It is a complex movement of several series of fluctuations, of different sweep, or amplitude. Each community which uses credit is, in a measure, independent of

others in supplying itself with a medium of payment. As its need increases, it refines its credit system. When the point is reached where no further expansion is feasible on the basis of its internal means, it draws on the neighboring communities with which it forms an intermediate group, so to say, in the interdependent national trade organization. The undulatory movement is felt in time by this whole group. It in turn relies at first on itself to supply new needs, but in time must press on similar groups in the world's exchange area. Thus we should expect a series of undulations, included one within another. The period between the points when it will be necessary either to get more money or make a new investment in credit machinery will, therefore, be longer where the credit machinery is extensive. That is, the sweep of the undulations should increase as communities grow. This is in accord with the showing of our curve.

It is easy to find arguments in support of the fourth inference from our statistics, concerning the relation of the economic character of a community to its use of credit-paper. The data of 1896 show clearly that differences exist. In what we may call residence cities the percentage of checks is high.[1] This is true, too, of college towns, where the college body is an important part of the population.[2] Agricultural communities show larger use of credit instruments than do manufacturing centers of similar size.[3] The reasons for these differences are not far to seek. The population of the residence, and the college, towns usually includes a large proportion of people with means enough to enable them to have bank accounts. Moreover, the incomes of many, perhaps of most, such people is usually received monthly or quarterly; at intervals, that is, favorable to the use of banking. The banking habit is promoted, too, by the high average intelligence and knowledge of such a population.

In agricultural communities ready money is not always to be had. The farmers' payments come at intervals, in considerable sums, for the sale of his products, and not uncommonly in the form of checks on a bank in some neighboring center. It is usually easier for him to deposit such checks and open an account on which he draws in payment of his own purchases. In a manufacturing village, on the other hand, where the income of a large number of people is in wages, usually paid weekly,

[1] Such as suburbs of large cities, like Brookline, Mass.

[2] Such as Amherst, Mass.; Ann Arbor, Mich.; Evanston, Ill.

[3] Of course, we are discussing the retail data here.

the sum each receives is not large enough to make it worth while for him to deposit and draw on the amount; his creditors are near, easily accessible; and it is less trouble and expense for him simply to apportion the money among them. Besides, the large number of foreigners in our manufacturing centers have not acquired the banking habit to such an extent as the people in the agricultural and residence towns; and possibly the average of education, of the kind which develops this habit, is lower in the manufacturing centers.

All this has to do, however, only with the *absolute* extent to which the use of credit-paper depends on the economic and social character of a community. There is no reason for thinking that a society which was purely manufacturing, or purely agricultural, in short, homogeneous, would show for successive population groups any different law of development of the use of credit instruments from the one already set forth. For the communities of a purely industrial society, like those of any other, would choose the method of payment which for the moment was least costly. All that has been said about the changing expensiveness of the various media of payments would apply to a homogeneous industrial society. Hence, in the absence of positive evidence to the contrary, we are justified in thinking that the *development* of the use of credit-paper in payment as population grows, is independent of industrial character; although as we have seen, the *absolute* percentage largely depends upon it.

We turn now to a question of vital importance for the practical value of our argument. Our data are static. May we interpret them dynamically? They show the relative proportions of credit-paper used in payment by different population groups at the *same time*. May they be taken to show the mode of growth of the use of credit-paper by the *same* community at *different times?* Does the whole country, does the business world, behave in the way indicated? There is no reason for thinking otherwise. According as the population groups from which the percentages are drawn are more or less typical, the more or less closely will they yield points through which a typical group *must pass as it grows*. The whole country, or the whole business world, so far as credit relations permeate it, is, with its multifarious economic conditions, the true typical group. A sit grows it passes through phases corresponding to those we have here observed. For we have seen that as the relative magnitude of different industrial groups changes, the change affects the proportion of credit-paper used, but not the course of development of the check habit.

Our conclusions then may be set down as general. They describe the course which the business world follows in meeting its need for a payment's medium, under existing conditions. Of course we cannot think that the curve which our statistics have furnished shows all the fluctuations of a curve for the whole business world. If we had statistics for the whole world, we should doubtless find waves of greater amplitude, periods of longer sweep, within which those of our data would fall as lesser series. The argument is that the *character* of the movement is revealed by our data and their graphic representation.

But of what practical value is all this? Does it throw any new light on the money question? It certainly does not tell us anything about the absolute amount of money that a community uses or needs. But it does throw some light upon the relative accounts used by communities of different size. To bring out its practical bearings, let us imagine a community with a fixed amount of money, a credit system well established, and a growing population and business. We neglect, as before, the demand for currency for wholesale trade. We may call the money needed for actual circulation, A; that used as a reserve for bank credits, B, which furnishes the amount of credit paying medium that we will call C. Then $A + C$ will represent the total volume of payments. In other words, C represents the bank deposits, or more properly that portion of the deposits which at the time in question is in active use. As business grows, a larger amount of payments medium is, of course, needed. In a modern community the demand falls first on the credit machinery. We go to the banks when we need money. The result will be a stretching, or refinement, of the credit system on the basis of the same reserve. In other words, the amount of money used for a reserve will be made to do the largest possible service. But by and by it will not suffice. Then, perhaps the community takes some money hitherto used in making actual payments. B becomes larger at the expense of A, and the new volume of payments, which we will call $A^1 + C^1$, will be greater than $A + C$. But there is a limit to this process. Money cannot be supplied from the amount which is ordinarily used in making average payments. Soon the community must face a condition of stationary business and falling prices, with all the evils and loss incidental thereto. It is possible that a supply of new money is available at a price, but this price may be so high that there is less social loss in permitting the price level to fall

for a time, than in paying the price for a new supply of money. There comes a turning point, however, when the reverse will be true. Then the community will purchase more money; there will be a comparatively sudden rise in the relative proportion of money payments as compared with credit payments.

The supply of money would not, therefore, be steady, even apart from the vicissitudes of mining. If gold and silver mining were of a character such that a steady supply could be relied upon to meet the varying demands, we still would find periods of sudden increases and relatively sudden degrease of the volume of metallic money as against the volume of credit payments. We appear at present to be passing through a period of relative increase of metallic money. The past twenty-five or thirty years has been a period of relative increase of the use of credit payment. But the credit machinery has apparently been strained beyond the point where the existing amount of metallic money constitutes an adequate reserve. The world, therefore, was confronted with a régime of falling prices. That this fallen price level has been a great hardship to many, there can of course be no denying. But if our reasoning is correct, it must be true that the world has suffered less from the fallen price level than it would have suffered by changing its policy and increasing the volume of metallic money. Otherwise it would have done so.

If these conclusions are correct, they suggest certain matters of importance. It would appear (1) that the world will get a new money supply when it really needs it. It would seem (2) that an artificial increase of the supply of money by such devices as bimetallism would only be a temporary expedient. It would not change the law of the growth of the relative volumes of credit payments and specie payments. It would simply substitute a higher price level for the existing price level for a time. It would seem (3) that an artificial stimulus of the credit machinery is also undesirable because it hastens the time when the community will need a larger amount of metallic money in order to avoid the evils of falling prices. We cannot here, of course, elaborate these points, but the argument of the article seems to point to their truth.

A few words may be added as to the light thrown by our data on the distribution of money. The phrase "distribution of money" admits of a double meaning. It may signify either the movement of money from place to place, or the division of the existing quantity

among different countries or groups of people. It is in the latter sense that the subject has always roused the greater popular interest, but it is in the other sense that distribution has received the fuller scientific treatment. The classical theory is a law of movement, not of apportionment. It tells us that the gold flows from areas of high price-pressure to those of low price-pressure, but it says nothing about the relative amounts, or about the composition, of the exchange medium used by different communities. How much money a community uses, absolutely, or in comparison with other communities of the same general economic character; what is the composition of its medium of payment; what proportion of its payments are made with money and what by means of credit; and how, as a community grows, the constituents of its medium of exchange alter with reference to one another, are questions of much interest and importance which the classical theory does not touch, and to which our existing knowledge offers unsatisfactory answers, if it offers any at all.

Our curve, if inverted, shows the course of the increasing money supply for growing population and business. Its progress is the counterpart, or complement, of the credit-paper portion of the payments medium. It is clear that the ratio of increase of money is by no means one of simple proportion. Indeed, the curve makes it evident that for a time the amount of money may relatively decrease with population and business growing. This, of course, is a well-known fact. But in no case does it appear that expanding business calls for a steady and proportionate increase in metallic money. The amount may be less or more than proportionate and is never steady in its growth.

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IRON ORE MINING IN MINNESOTA.[1]

THE iron ore mines of Minnesota, so far as they are developed, are situated in St. Louis county, about midway between Lake Superior and the boundary line of Ontario. They are located in two ranges, which are about twenty miles apart and extend in an easterly and westerly direction; the more southern of the two is the Missabe, the other the Vermillion Range. The ore deposits do not stretch in an uninterrupted body across the country, they are scattered along in groups, at irregular intervals; long stretches of non-merchantable ore being sparsely interspersed with groups of rich mines. On the Vermillion Range two groups of mines are now in operation; one at Ely and the other near Tower, on the east shore of Lake Vermillion. The mines on the Missabe Range are centered around the towns of Biwabik, McKinley, Sparta, Eveleth, Virginia, Mountain Iron, and Hibbing. A number of new mines are being developed near Sharon and Buhl. All mines on the Vermillion Range are underground, ranging in depth from five hundred to one thousand feet. There is no mine over two hundred and fifty feet in depth on the Missabe Range, but quite a number are surface or daylight workings. The way in which the ore from such mines is extracted differs materially from the old practice of mining underground deposits; two systems are in use, milling and steam shovel work. The latter is conducted on the same plan as the work in an ordinary gravel pit, with the exception that first the overlaying gravel and sand is stripped off the ore body. The ore is shaken loose by powder blasts, and loaded by steam shovels into railroad ore cars. In order that this system of work shall be economical, there must be no delays. The milling system is resorted to in all mines where the ore body lies at

[1] Reference is made to HORACE V. WINCHELL'S *Minnesota Iron Mining, Economically and Statistically Considered* and the *Seventh Biennial Report of the Bureau of Labor of the State of Minnesota.*

no great depth from the surface, and where, for various reasons, steam shovel work is not advisable.

The essential features of the milling system are, first, the removal of the overlying-ground and the sinking of hoisting shafts in the side walls to the bottom of the ore deposit. Drifts and cross-cuts are made from the shafts through the ore body, and numerous raises are cut to the surface. The raises are timbered and provided on the lower end with proper appliances for loading the ore into tram-cars. The ore on the surface is loosened by blasting and falls down the raises. At the bottom it is drawn out and conveyed to the shafts, where it is hoisted to the surface. This system of mining is very economical and requires very little timbering, aside from that of the drifts, cross-cuts, and raises.

All the ore from the Vermillion Range, and much from the Missabe Range, goes to the docks at Two Harbors; the remainder is taken to West Duluth, or to Allouez Bay, near West Superior. The year 1900 was marked by its great activity in iron ore production. The year's shipments, from all Lake Superior mines, amounted to 19,059,393 long tons, and the Minnesota mines contributed a little less than 50 per cent. of this amount. The ore docks mentioned above received and loaded, during the season, 9,465,355 tons of ore; 7,809,535 tons came from the Missabe, and 1,655,820 tons from the Vermillion Range. Last year's production showed an increase of 1,067,469 tons over that of the preceding year. Three railroads divide the transportation of the ore from the mines to the docks, and the figures best give an idea of the heaviness of the traffic. One mine of the Missabe Range loaded and shipped last year 14,000 tons of ore in one day; that is to say, within twenty-four consecutive hours. Four steam shovels were at work scooping the ore from the stock piles into the railroad cars. Five hundred and sixty cars of twenty-five tons capacity and eleven locomotives were required to move that quantity. An ore train generally is made up of one locomotive, fifty-one ore cars and one caboose, and all the cars and locomotives coupled together

would have made a train two and one-half miles long. Since last year, however, ore cars of thirty-five and fifty tons capacity have come into use. The total amount of last year's production, loaded in cars of twenty-five tons capacity, would have required 378,614 cars, and 7,424 locomotives to move them. They would have made a train 1,816 miles long. Bearing in mind that lake navigation generally lasts but eight months of the year, and that with the close of navigation all ore movements by rail come to an end, it will not be surprising to learn that ore trains have precedence over any other train on the road.

The great bulk of the men employed in the mines, seven to eight thousand, are foreigners. Mr. John Pengilly, general manager of the Chandler Mine at Ely, says in a description furnished to the Geological and Natural History Survey of Minnesota, 1896–1898: "There are not more than 10 per cent. of our men who speak the English language, and not more than the above number who have the remotest idea of mining." Nearly 40 per cent. of all so-called miners are Finlanders; another 40 per cent. are Austro-Hungarians; Italians form about 8 per cent. of the whole, and the rest are American, German, Scotch, Swedish, Canadian, Welsh.

Each of the two principal classes present distinct features of interest to the student of political economy. The Finlander, as a rule, is a strong, well-built person, all muscle and bone, and from childhood used to hard work and meager fare. Reared under adverse circumstances, and under an unsympathetic government, he came to this country buoyed by the hope of bettering his condition, and to enjoy the free exercise of political rights. It is his ambition to become a citizen, and one of his first acts, as soon as an opportunity is presented, is to declare his intention of naturalizing. According to the moral influence of his surroundings, the character of the Finlander as a citizen will be determined. We find the best proof for this in relative conditions of the second oldest mining town of both ranges—the town of Ely, on the Vermillion Range.

The Chandler mine was opened in 1888, and the Pioneer

started up the following year. Prior to this Ely was practically unknown. Today there are five mines in operation around Ely, giving employment to about 1,300 men. The town has a population of 3,700 inhabitants, which includes nearly 90 per cent. of the mine employees. There are no company dwelling-houses, boarding places, or stores, and the employees, when not on duty, are free from restraint by the company.

Of the total number of mine workers at Ely, 40 per cent., or about 520 persons, are Finlanders. A Finnish national temperance society of 350 members is maintained principally by mine employees. They have a fine, steam-heated hall, lighted by electricity, and with a seating capacity for 500 people. Weekly meetings and occasional entertainments are held, and the society, in addition to its efforts to elevate and improve its members, maintains a sick and death benefit feature. Mr. Pengilly, who has been living at Ely since the opening of the first mine, says that the beneficial effect of this society upon its members cannot be overestimated; that its influence has helped to reduce the number of accidents, incidental to the hazardous occupation of mining; the companies obtain better workmen, and the families of its members are lifted to a higher social standing. Of ten graduates, comprising this year's class, four were children of Finnish parentage. Many Finnish miners invest their savings in farm land, working on the farm during summer and fall, and returning to the mines for the winter; continuing thus until they have cleared off all incumbrance from their future homesteads.

The Austro-Hungarian, a man well built and by nature fitted for hard work, shows different characteristics. He is not as ready to become assimilated, his thoughts linger more in the wild Pushtas of his far-off country, and it seems to be his dream to get enough money to go back there to live. There are, of course, many exceptions to the rule. Single Austrians will club together and hire one of their country-women to do the housekeeping for them, they buying the provisions, for which each one pays his share, and all surplus money thus saved goes into

the stocking or bank, for the purpose already indicated. The sanitary conditions under which they thus live are open to much improvement; but they make, in a general way, a good labor stock, which, particularly in dull times, will stand much driving and pushing. An effort is being made of late, at different mining towns, to introduce temperance features into the beneficial societies maintained by the Austro-Hungarians.

Of the third large class of mine workers, the Italians, it is to be said that they are not of such strong physique as the Finlanders or the Austrians, but they are persistent in their work; and, as one mining captain put it, "they do not take such big shovelfuls as the others do, but they pick away, and when the day is over I find that they have done just about as much work." They are, however, better adapted to surface work, and prefer to labor in places where the sun is shining upon them. The man from northern Italy is, according to the statements of mine officials, docile and very willing to work, and in good times, with high wages and plenty of work in sight, they are a better class to get along with than men of other nationalities. The south Italian is certainly frugal and saving, so much so, indeed, that a dozen of them will huddle contentedly together in sleeping quarters which, under ordinary circumstances, would be hardly sufficient for half that number. They believe in the "stocking" savings bank, and their ambition leads them to dream of a banana push-cart in the near future, or ownership of a grape patch in some southern country.

The sturdy Cornishman is considered the mainstay in all mines. He is an experienced, cool-headed miner, reliable, temperate, and industrious. Out of this latter class come the greater number of mining captains, foremen, and bosses. Other nationalities have too small a representation among the miners to be specially discussed here.

The conditions of mine work on the Missabe Range, as has already been stated, differ in many respects from those of the Vermillion Range, and their effect upon the social conditions of the employed is very observable. On the latter range all mines

are underground, and offer a chance for all-year, steady work; which in itself is a great inducement to maried men to settle down and become residents of the mining town.

Underground mines continue their operations after closing of lake navigation, the winter's production being deposited on the surface for future shipment. But things are different on the Missabe Range; here we find many open-pit or surface mines. They are worked during the navigation season only, which at best is only seven to eight months, and the men are forced to idleness for the remainder of the year, or have to hunt work in the logging camps on the range. Other mines, which are worked by the milling system, reduce their working force with the advent of winter, and they naturally give preference to the married men. Moreover, taking into consideration the fact that the mines on this range are as yet in a state of development, it is obvious that the inducements for married miners to settle down are not very great; and this, together with outside influences, has created a disposition of unrest and an inclination to shiftlessness among miners; it has brought forth the tramp miner.

The latter is a great source of complaint from mine managers. They say that conditions had become so unbearable to them that they were compelled to adopt strict rules relative to observance of working time and payment of wages. One mine superintendent said:

> The habit of giving to private persons orders on their pay had become such a nuisance that during some months we had to handle over one thousand of such orders, of which a great percentage had been given to saloonkeepers; yet we had only about 400 men on our pay roll.
>
> The Austrian is in the habit of celebrating every holiday on his calendar, and as they did not think it necessary to give us previous notice of their intention, we found on many a morning our working force so crippled that we had to shut down altogether for that day. So in order to protect our own interests, we gave strict notice that none but legal holidays would be recognized.

Another great annoyance is the disposition of single men to quit work at any time, knowing that they again will find ready

employment at some other mine or in the lumber camps. The slightest provocation, or the desire to go on a spree, is, as mine officials say, a sufficient inducement in times of plenty of work and good wages to quit a job, and if such men cannot find employment again under their own name they will hire out under an assumed name. All mining concerns have one monthly pay day, and many of them have adopted the rule that anyone who wants to leave their employ has to give ten days' notice, and settlement for back wages will be made only after expiration of such time.

The chances for beneficial recreation and elevating intercourse are but meager in mining towns, and unmarried men are too much at the mercies of the saloon. Too much money, which otherwise would be saved, is thus expended in society injurious to both health and morals. It must be stated, however, that time will also change this condition; that with the development of the mines on the Missabe Range, chances for all-year work may become better, and that steady, married workmen will replace the tramp miners.

Noteworthy mine settlements are already established at the Fayal mines near Eveleth, at Sparta, and at the Elbe mines, near McKinley. These properties are maintained by the interested mining companies, which also take care of the sanitary regulations. The town of Fayal is a very attractive place; over five hundred miners' families live in company houses; some of them have bought their homes, paying a small rental for the land, and the surrounding grounds are laid out in gardens or lawns, which help to make the place cheerful, attractive and home-like. Here, as in all similar places, no stores nor saloons are tolerated.

Wages for mine workers have steadily increased during late years; this will be seen by the following table, which has been secured at different mines of both ranges:

	1896	1897	1898	1899	1900	1901
Miners - - -	$1.83	$1.77	$1.86½	$2.00	$2.20	$2.42
Trammers - -	1.61	1.54	1.81½	1.87½	2.00	2.08
Underground laborers - - -	1.82	1.70	1.77	1.86½	1.80	2.10
Surface laborers -	1.40	1.34	1.48	1.56	1.75	2.10
Contract workers	.....	.....	.....	.....	2.35	2.52

The State Bureau of Labor, in its seventh biennial report, gives the following data:

	1899	1900
Skilled labor - - - - -	$2.80	$2.91
Miners - - - - - -	1.93	2.09
Trammers - - - - - -	1.79	2.08
Underground laborers - -	1.74	1.97
Surface laborers - - -	1.75	1.98
Contract workers - - -	2.09	2.16
General average - - -	$1.89	$2.07

Mining is classed by insurance companies as a hazardous occupation. The chances for injuries in a mine are manifold, and they come in most instances unforeseen, and in spite of all watchfulness and care. A small quantity of falling ore or rock will suffice to crush a person's limbs, and the careless handling of explosives accounts for a number of mine casualties.

The system of contract work, it seems, has also something to do with a great number of fatalities, incidental to mining. The desire to make big wages is an inducement for workmen to take chances, which, under other circumstances, they would not assume. Foremen and officers are ever on watch, directing the men in their work, and it is an established rule in mines that, first of all things, men must look out for their own safety; but a little too much ore may be taken out of a place before the protecting timbers are put up; men may return to their work, after a blast, before the person in charge has examined the roof overhead, and this carelessness may result fatally to the workmen:

The inspection reports for the years 1898, 1899, and 1900, as

compiled by the State Bureau of Labor, give the following figures relative to accidents:

	Mines	Men	Fatal	Serious	Minor acc'ts
1898	27	4,431	18	39	169
1899	30	6,645	34	71	316
1900	33	7,929	39	41	363

It should, however, be mentioned that two explosions alone were the cause of fifteen fatal and three serious accidents during last year. The fact, furthermore, that some mining companies report every slight bruise or cut, which may involve a disability to work, of one or two days only, it seems, has to account for such high figures in the accident reports.

All mining companies have arrangements made for medical treatment and care of their men in case of injury or sickness, and as a result of this, spacious and fine hospitals have been built in some mining towns near which a great number of men are employed. Prominent amongst them are the hospital at Ely, the company's hospital at Fayal, and the one recently opened by Dr. More at Eveleth. The latter is modern in every respect, and has space for forty beds, besides a few rooms for private patients. All mine employees have to submit to the deduction of one dollar per month from their wages, and they receive, as an equivalent, free medical treatment either at the hospital or at their homes, if injured or sick, and the hospital staff will minister also to the miners' families without looking for extra compensation, except in cases of childbirth, etc.

Benefit clubs have been organized at many mines. There is, however, no uniformity in their features, but all have for their object a weekly payment to any member who, by accident, has been disabled, and a sum of money in case of total disability or death as a result of an accident.

The efforts of the Chandler and Oliver iron companies to provide at Ely a place of recreation for their employees should also be mentioned. At beautiful Long Lake, near the Chandler

and Pioneer mines, is a strip of land four acres in extent, leased by the Chandler Iron Co., and this tract, which is nicely wooded, has been transformed into a park. Bath houses for both sexes, a grand stand, a pavilion, and other booths, have been built, and the families of the Ely miners here have an opportunity to while away the hot summer days. The mine managers, who jointly carry all expenses for the maintenance of this park, deserve high credit for this piece of humanitarian work.

JULIUS MOERSCH.

ST. PAUL, MINN.

NOTES.

PROMPTED by the marked success of the Commercial College at Leipsic a new institution for higher commercial education has been opened at Frankfurt a. Main. This is the Akademie für Sozial- und Handelswissenschaften, which began its work October 21. The institution differs from that at Leipsic in that it is entirely independent; the promoters of the Frankurt Akademie considering that close connection with a university is somewhat detrimental to the peculiar work of commercial education. At the same time both institutions require preparatory work equivalent to that required for entrance to the universities.

The academy is established under the joint auspices of the city, the Institut für Gemeinwohl, the Chamber of Commerce, and the Polytechnic Society, which have together granted an annual income, in addition to fees, of 70,000 marks.

The scope of the school is somewhat broader than that of the Leipsic school in that it attempts to provide courses especially suited for those in government service as well as for those engaged in commercial pursuits. At the head of the institution is Dr. Andreas Voigt, well known as an enthusiast over commercial education. Among the permanent instructors are to be noted Dr. Pohle from the University of Leipsic, who lectures on economics; Professor Burchard from the same university (commercial law), Dr. Paul Arndt (commercial policy), R. Lambert, from the Leipsic Commercial College (commerce), and Dr. von Moellendorff, formerly German consul (commercial geography and consular system). Other professors from neighboring universities, and some public officials assist in the instruction, so that the faculty numbers twenty, with the announcement that others will be added.

The attempt thus to establish an institution of higher learning independent of the existing universities is a somewhat interesting innovation. A professor in a neighboring Prussian university, in a conversation with the writer, characterized the new school as a "mock

university." In general, however, the plan has been well received and the attendance is certainly gratifying. On the opening day 302 students had registered. Of these 235 were hospitants, 28 regular students, and 39 hearers.

WAGES AND INTEREST AS DETERMINED BY MARGINAL PRODUCTIVITY.

MR. PADAN'S energetic attack on my theory of distribution in the JOURNAL OF POLITICAL ECONOMY for March, 1901, raises one principal question and a number of secondary ones. A reply which should cite and answer all of the subordinate questions would have to be very extended. As a rule it is my preference to refrain from replying to criticisms until both my theory itself and the case against it shall have been more completely presented. There is taking shape a volume, the purpose of which is to afford a brief outline of the static laws of distribution thus far published, and also such an outline of dynamic laws, as is needed for completing the theory in its main features, and making it more fully interpret the facts of life. This work may meet a number of objections which have been urged against the static theory as it stands alone.

The present volume has indeed tried to describe the general nature of the dynamic forces which act in distribution and their relation to static forces. The sixth, twenty-fifth, and twenty-sixth chapters of the book are devoted largely to this subject, and a reading of them will remove a certain misapprehension which is likely to exist in the minds of those who, without having read them, have seen the concluding part of Mr. Padan's article. In this part, by way of criticism of my view, he states that "the rates of wages and interest at any time are the result of the play of dynamic forces," that "they enjoy no immunity from change,"[1] that "the determination of the rates of interest and wages is a fascinating problem, for the reason that it is a *living*, ever changing problem," etc. The implication is that I have treated these rates as though in actual life they were fixed and unchanging, and have forgotten that, as Mr. Padan says, dynamic forces "both dominate the actual rates and exercise control over that real but elusive center of movement, the so-called standard about which the daily rates are ever

[1] JOURNAL OF POLITICAL ECONOMY, vol. ix. pp. 189–190.

fluctuating."[1] This sentence is a good abbreviation of what I have said on this subject. Whatever may be the shortcomings of my theory a neglect of dynamic elements in the problem to be solved is not one of them.

The chapters referred to may be trusted to make it clear that the description which Mr. Padan gives of a static state as "an instantaneous photograph of a dynamic period at any moment"[2] does not apply to the condition that is described in the work under criticism. The static level of the ocean would not, in my view, be well represented by an instantaneous photograph of the waves. Mr. Padan's main contention, however, is not dependent on any issue concerning dynamic forces. He claims that the law of final productivity, as I have presented it, assigns to labor and capital, as static incomes, amounts which together must exceed the total product of industry. In a certain diagram I have represented this total product by an area and the amount of wages, under static conditions, as a part of this area, leaving a remainder which must equal interest, if the contention that a static adjustment leaves no profits to the employer and imposes no losses on him is, in fact, true. Mr. Padan asserts, first, that the area representing this remainder is not so drawn that, independently of the question of profits and losses, it must equal interest. It represents what is left in the *entrepreneur's* hands after wages are paid, but the figure does not in itself show that the capitalist is destined to get this remainder. He asserts, secondly, that the amount assigned to wages in the figure is an exaggerated amount.

In a perfectly static state would wages and interest be accurately determined by the law of final productivity? As so determined would they together equal the whole product of industry? Would each of them be the leavings of the other? These are the essential questions at issue. My argument is an economic one and could be complete even if the diagrams which illustrate it were taken entirely out of the book. Moreover if diagrams were used, they might be confined to illustrating the direct action of the law of final productivity — the action which, in this case, fixes wages — and might omit all reference to the significance of the area which, in this case, is residual. There is no need of so drawing this area that, *from the manner in which it is drawn*, it shall appear that it must measure interest.

The conditions of the static state require that labor and capital

[1] P. 190. [2] P. 187.

shall get the whole product of industry, and I do not understand that Mr. Padan denies this fact. The important part of his criticism is that which tries to show that my method of determining wages by a direct application of the law of final productivity gives an incorrect result, and that, when I use the same method in determining in a direct way the interest on capital, the result gained is again incorrect. This law of final productivity, as he thinks, exaggerates both of these incomes, and causes the sum of them, as thus determined, to exceed the whole product of industry. Of course, then, what is left after one is paid would not equal the other.

The theory under criticism runs thus: A unit of labor added to a working force adds a certain amount to the product that is created, and under perfect competition, and in the absence of all the changes and disturbances which characterize a dynamic state, it would get, as its pay, the amount of this addition. Every other unit of labor would receive a like amount. In a corresponding way a unit of capital added to a productive fund would add a certain amount to the product, and under the same conditions of perfect competition and the absence of disturbing elements, would get this amount as its share of interest. Every other unit of capital would get a similar amount. Wherever, if after paying all wages and interest *as thus determined* the employer should find that he had a profit remaining, or that he had suffered a loss, it would be an indication that the perfect static adjustment which is postulated in the theory had not been made. Mr. Padan's claim is that if wages and interest were actually determined in this way they would call for sums that would impose a loss on the *entrepreneur*, since they would take from him more than the industry would bring in; and he has used the diagram that illustrates the principle of final productivity in trying to establish this claim. By making the final increment of labor and that of capital large he obtains areas representing wages and interest which, taken together, exceed that which represents total products. He shows that if we construct a diagram in such a way as to represent the force of labor as divided into five increments, test the product of the last increment in the way that is proposed in my book, and then multiply the result by five, in order to get the product of the entire working force, we shall get a result that is larger than it would be if, in making the test, we divided the force into ten increments. Five times the apparent

product of the fifth increment is a larger amount than ten times the product of the tenth increment.

If, in like manner, we test the productivity of the capital by dividing it into five equal portions, ascertaining the amount that is apparently due to the fifth increment, and multiplying that amount by five, we shall get a total quantity that is larger than it would be if we divided the capital into ten parts, measured the product that is due to the presence of the tenth part, and multiplied this amount by ten. The two totals obtained by tests in which, on the one hand, a large final increment of labor is used, and on the other, a large final increment of capital, make together a grand total that is appreciably excessive, since it obviously exceeds the total product of the labor and the capital.

If the mathematical study had been carried farther, it would have shown that the amount of the excess of apparent wages and interest over total products varies directly with the size of the increments of labor and capital used in making the tests. If we made them equal to the whole amounts of labor and capital, we should attribute the entire product first to labor and then to capital, and the sum of the two incomes would be twice the product. As the increments are made smaller, the excess of the two incomes over products becomes smaller, and it practically vanishes when minute increments are used. A hundred times the product of the one-hundreth part of the working force plus a hundred times the product of the one-hundredth part of the capital would exceed the total product by a very minute amount; and if we used the thousandth part of each agent in making the tests, the result would give as near an approach to the utmost conceivable accuracy as an economic law ever needs to attain.

The truth to which Mr. Padan's reasoning would, if it were completed, lead is that in any application of the general principle on which the theory of value and the theory of distribution rest, which may be called the Law of Final Economic Efficiency, minute increments of the agent whose efficiency is testing need to be used. The law of final productivity of labor and of capital is one phase of the more generic principle, and the law of final utility of goods, on which market values depend, is another. If, in gauging the selling price of the supply of wheat, we withdrew a fifth of it, ascertained what the public would pay rather than be deprived of this amount, and inferred that the market price of the whole supply would be five times that amount, we should be gravely misled. Our estimate of the total value

of the wheat would be greatly exaggerated, and it would become accurate in proportion as we reduced the size of the increment the utility of which is the basis of valuation. Accurate estimates of the productive power of labor and capital also require the use of small increments, and in this case the approach to mathematical exactness which is made, as the increments are reduced, is more rapid than the reduction of the increments. A continuation of the graphic study would reveal this fact, since it is connected with the form of the productivity curves. Take the product of the one-thousandth part of the labor and multiply it by a thousand, and you get an amount that may not exceed the true product of all the labor by a millionth part. Get an equally accurate measurement of the product of the capital and add this to the amount which the former measurement gives as the product of the labor, and the sum will exceed the output of the industry by a sum that is as near to a mathematical zero as is necessary for any end theoretical or practical. If, for any purpose, the remaining nearly infinitesimal variation were of importance, it should be noted there are mathematical ways of eliminating it.

When in measuring the product of the labor, we use a large fractional part of the force as the basis of the test we get, as the product of this exaggerated increment, a quantity that includes, besides the true product of this labor, a certain excess, and this excess is, in reality, a part of the product of capital. So also in measuring, in a like way, the product of an exaggerated increment of capital, we get an excess that really is a part of the product of labor. Calculating either of the totals on this basis gives as the seeming product of one of the two agents an amount that equals that product plus a moiety of the product of the other agent. Add these totals and of course the sum exceeds the joint product of the two. The equation that we can legitimately make stands thus: The product of labor plus a part of the product of capital, if added to the product of capital plus a part of the product of labor, gives a total which exceeds the joint product of the labor and the capital. By reducing the size of the increments used in applying the tests to small dimensions we make the excess microscopic. On this point and all the minor ones to which Mr. Padan's article refers, I rely on the verdict to which a careful study of the theory itself will lead.

JOHN BATES CLARK.

A GERMAN VIEW OF "WOMAN'S SPHERE."

DILETTANTISM in the kitchen and a sentimental regard for the traditional hearthstone must be met by co-operation and a consciousness of the historical development of the family. The German student of domestic problems, Lily Braun, has recently discussed them under the title, "Woman's Work and Domestic Economy." Her intensity reminds one of Charlotte Perkins Stetson, but she is far less radical, although it might be expected that German conditions would result in a greater reaction.

The author's insistence upon a decided change in modern methods of housekeeping is based upon her belief that:

> The external form of the family has constantly varied.[1] The enduring element, in spite of the variation, has been the relations between man, wife, and child. Its depth and significance have developed in proportion as it has been freed from external conditions. "This freedom from hampering material circumstances does not mean, in the least, the dissolution of the family; it means, rather, the possibility of true family life." Lily Braun agrees tacitly with Mrs. Stetson that a "family unity which is only bound together with a tablecloth is of questionable value."

In tracing the history of woman's work, the author says:

> Housekeeping (die Hauswirtschaft), as one commonly regards it, is the most conservative element in social life. It seems to be the rock about which the waves of scientific development and commotion rage, without breaking off more than a few bits. Yet, in reality, it is the mirror which reflects all the pictures of the outer world and throws light upon the history of civilization.

In pre-historic times when man received out of the lightning the precious fire and realized its significance he established the first hearth and made woman the guardian of the flame. While, in course of time, the hearth has been supplanted by the central heating system and the hundred and one hearthstone activities become specialized, the hearthstone idea has become so incorporated in the social creed that to disagree with those who believe the individual cook-stove is as necessary as the individual conscience, is to be accused of social heresy. The author's method of treatment shows her to be fully aware of her audience. She makes very plain the gradual growth of home industries to their culminating point in feudal times, and then

[1] *Frauenarbeit und Hauswirthschaft.* By LILY BRAUN. Berlin: Vorwärts, 1901. 12mo, pp. 31.

follows their gradual displacement up to the present, when cooking alone remains largely an individual occupation, and spinning, weaving, sewing, soap and candle making have all become developed and put outside — or taken outside — the home.

Among the poorer classes this specialization meant almost a complete destruction of the home in which the first looms crowded out the possibilities of family life apart from continued toil for the means of existence. Today, excepting in the "sweating" industries, the factories have done away with this crowding but the homes have not rallied; they are but temporary sleeping and eating places. "Deserted stands many a home of the poor; the little flame on the hearth — upon which will be heated the meal prepared the night before, when the man and his wife come back for a short rest at noon — recalls still the hearth fire of former times."

In the houses of the rich little is done beyond personal service and cooking. And as a result of this change in woman's occupations in the home girls and women are free to undertake other work. Those who can afford this leisure betake themselves to idle pleasures or the arts, but the women of the poor must follow the machine into the factory.

It is, then, in this extension of domestic work that the position of the workingwoman becomes anomalous. She is forced into the struggle for existence alongside of man, but she is still supposed to fulfill her woman's function in the home as housekeeper and mother. Therefore, she becomes less than man's industrial equal because of dissipated energies in the two fields, and she becomes his greatest enemy. The increase in the number of married women in industry is added proof that the wheel still turns which was set in motion little more than a century ago. In 1895, 16 per cent. of the workingwomen in Germany were married; in Austria 24 per cent.; and in France 30 per cent.

The author brings out the effect of this factory life upon the lives of the children; the weakest come to bear the heaviest burden. "The more children a working woman has, the more her presence is needed at home, just so much greater is the need which forces her out to work."

The position of the middle class woman is not much easier if they feel the necessity of entering any of the professions. They must still be compelled to be housekeepers, even though they have a servant. The constant distraction of the mind by the petty details of meals,

sewing, and sweeping is sufficient to render impossible any coherent scientific work. Here, again, there is a dissipation of energy, mental energy.

Frau Braun does not lay as much emphasis as she might upon the great loss to society which results from the modern domestic arrangement, a loss to the present through lack of organization, and a loss to the future through the effect upon health of mind and body. Yet, as a socialist, she necessarily realizes the bearing of this question upon the fundamental ones of social and industrial readjustment. She proposes a plan for co-operative housekeeping which is not at all novel upon this side of the water. The points of advantage for the working class are most evident where the care of children is concerned. Trained nurses, as well as trained cooks, would be regarded essential in her plan. In a large apartment house built for co-operative housekeeping the privacy of the family would still be maintained in spite of the disappearance of the private kitchen. Meals, cooked in the central kitchen, could be eaten in the common dining-room or taken to the apartments of those who preferred their own dining-rooms.

The means for undertaking such an establishment is discussed with a recognition of the present dependence of labor upon capital. The author suggests building and loan associations or interested capitalists willing to take the risk of investment.

The results of such a change are evident. When at home, working mothers would have time to devote to their husbands and children and to the cultivation of their minds and bodies. Frau Braun quotes Krapotkin:

> The emancipation of woman does not mean the opening to her of the doors of the universities, courts, and parliaments; it means much more the freeing of woman from cook-stove and wash-tub and the establishing of a system which will allow her to educate her children and take part in the social life.

The student of social evolution knows that the small kitchen must go as did the small work-shop. This study from the German point of view has in it little that is original, but much which will bear repetition from now till the time when sentimentality gives way to necessity and the vitality of the word "home" does not depend so much upon the material surroundings of a family as upon the consciousness of a deep and significant relationship, eternally the same no matter how outer forms change.

CHARLOTTE TELLER.

A HISTORY OF THE LATIN UNION.[1]

THE world of letters in Europe has not allowed the work of the American universities to pass unnoticed; and rightly so for nowhere else has progress in recent years been so rapid. The University of Chicago particularly commends itself to the attention of economists both by its courses of instruction and by its publications, which reflect the work of the University. The latest of these publications has peculiar interest for us, since the subject of which it treats is essentially European — the Latin Monetary Union.[2] Many are the authors who have described, discussed, lauded, or criticised it, but one may say it still awaited its historian. That he has been found not in France nor in Italy, neither in Belgium nor in Switzerland, but in the United States is no occasion for regret on our part. It has only resulted in making the enquiry more impartial and not at all in making it less complete, for Mr. Willis has neither been ignorant of, nor neglected any of the sources which might be of service to him. I myself took great pleasure, while I was director of the French Mint, in opening to him its archives. I could testify, were not the book in itself sufficient witness, to the conscientiousness and the patience which he showed in mastering the original sources. He has read or examined everything, the official texts, the *procès verbaux*, the discussions, and even the articles in the reviews and the newspapers. Some of the chapters are models of analysis and synthesis. Such are those in which he has successively initiated the reader into the genesis, the progress, and the effects of this monetary syndicate which, inaugurated by the convention of December 23, 1865, has continued, despite all vicissitudes to the present time. A foreigner has need of great clearness of vision to distinguish in the causes of that international agreement between the influence of economic, and of political considerations. Mr. Willis has made manifest the practical difficulties which compelled us, thirty-six years ago, to reduce the standard of our fractional silver in order to check its exportation. The same necessity had been felt in Italy, in Belgium, and in Switzerland. The independent action of these states brought about certain differences of which speculation sought to take advantage at the expense of the circulating medium.

[1] Translated from the French manuscript by Henry Rand Hatfield.

[2] *A History of the Latin Monetary Union.* By H. PARKER WILLIS. Chicago: The University of Chicago Press, 1901.

The convention of 1865 in itself had no other object than to secure uniformity in the monetary systems of the contracting powers. But it is certain that Emperor Napoleon III., and public opinion as well, expected more from that agreement than was promised by its text.

For the theorists it was a first step and a long step toward the general unification of monetary systems. It was the *franc* beginning, as the *metre* had recently done, to conquer the world. Without doubt it was a pity to see the campaign open with the debasement of the very unit which they were ambitious to have accepted by the civilized world. The franc of 1865 (reduced to .835 fine) was no longer the original franc. But in addition to the fact that the écu of five francs (the French dollar) remained unaltered as the personification of the silver standard, as it had been defined by the law of 17 Germinal, an. XI, the triumph of the gold standard was announced as near at hand, and the twenty-franc piece (the Napoleon) appeared as its representative.

Our statesmen, whether economists or not, saw with satisfaction the prestige of France and the empire established by these monetary unions, which would bring others in their train. The public, aided by official eloquence looked on the Latin Union less as a remedy for previous difficulties than as a victory and a promise for the future.

Unhappily these expectations presently proved fallacious. The introduction of legal-tender paper in Italy and in Greece soon showed that at least two of our allies were preparing to play, in the family which they had just formed, the unwelcome rôle of poor relations. Then came the war with Germany, the defeats, the invasions, the siege of Paris, the mutilation of French territory, the indemnity of five milliards, and the commune. The notes of the Bank of France ceased to be redeemable in specie, and this situation bade fair to drag on for many years. Mr. Willis recalls all this without dwelling on it. He would have done well to call attention in passing to the extraordinary solidity which French credit exhibited in those tragic days. That our bank notes remained either at par, or very near it in the midst of such convulsions, that the payments on the public debt were not interrupted, and that France, as soon as Germany was paid, was able so promptly to secure needed revenues, is a spectacle not common in the financial history of nations. Bimetallism itself could derive some honor from such a crisis so well passed. But bimetallism was about to suffer a most serious malady caused by the depreciation of the white metal, and

everyone knows that despite all the efforts of its friends it is now dead. The Latin Union has survived only by transforming itself.

Mr. Willis has placed in a clear light the changes made in the original agreement of 1865, first by the supplementary convention of 1878, and later by that of 1885. The first provided for the downfall of silver by definitely prohibiting the minting of écus, the latter for the first time regulated, in the interests of France, the conditions for the eventual dissolution of an alliance of which we were bearing all the burden. France was invaded from day to day by the écus of Belgium and by those of Italy. Italy had escaped momentarily from forced circulation only to fall back again. Neither gold nor silver were longer to be seen in the peninsula, and because of its economic and financial difficulties the Italian government was led to interpret its obligations in a more and more elastic manner. Mr. Willis probably does not know how much advantage our neighbors reaped from the Bourbon piasters (Neapolitan dollars) which were always about to be recoined but which were always turning up somewhere untouched. The Eretrean piasters, too, after the victories of Menelik, fell back on the metropolitan banks. Finally, how shall one reconcile with the spirit of the original treaty of the Latin Union the decrees of King Humbert giving a preference to gold as a reserve in these banks? Such expedients gave all too good reason for the government of the French republic to take precautions for the future in regard to which the imperial government had been careless. Such was the aim of the difficult negotiations of 1885. The convention of 1865 has been compared to a marriage contract; that of 1885 has somewhat the form of a will. But to make one's will is not to die, and it is possible that the Latin Union will still live for a long time.

The changes which the Latin Union has undergone are described by Mr. Willis with much more detail than I could, or would wish to enter into here. The texts of the conventions which he gives *in extenso* in an appendix are almost superfluous after the minute analysis which he has made of them, and possibly he might have abridged somewhat without injury. The subject is not one which appeals to the imagination, and perhaps American students who read of the complicated developments will find it somewhat dry. Personally I have not for a moment received this impression; for where others may merely spell out proper names which mean nothing to them, I see reappear, as if conjured by an occult power, those statesmen and scientists all of whom

I have known well and many of whom were dear to me. To speak only of those whom death has already taken from us, there are the interesting figures of J. B. Dumas, the great chemist, of Michel Chevalier, the eloquent professor, of Emile Laveleye, the subtle orator, of Adolph Soetbeer, the indefatigable statistician. And among the ministers whom the Union has employed I may at least mention those of our own country, Esquirou de Parieu, Magne, Leon Say, Tirard, Peytral.

At times Mr. Willis, while reciting the complicated drama of the two standards, neglects to name the actors. Of the great international conference at Brussels in 1892 he speaks only briefly. Without doubt this is because the results of the conference, as was proper, were negative. Nevertheless, while reading what he has written, I see again the Palais des Academies, at the corner of the Parc Royal, the meeting place for our long deliberations; I see again, grouped according to countries along the green tables, the delegates who represented so many different governments, and first of all, more numerous and more impressive in stature and features, the delegates from America. They were Senator Allison and Senator Jones, Mr. James B. McCreary, President E. Benjamin Andrews, and Mr. Henry W. Cannon. Of all these men their colleagues of 1892 have retained the pleasantest memories. At first they spoke little, and we were astonished that the United States, having taken the initiative at the conference, had no program to submit to it. Later their reticence gave place to a less discreet attitude, and two whole days, in particular, were spent in listening to Senator Jones, the silver advocate *par excellence*, sound the beauties and the virtues of bimetallism. His eloquence was indefatigable. He turned facing now the French, now the Germans, now the English, apostrophizing each country in a ringing voice. His argument seemed to us only moderately scientific, but we admired none the less the dignity of his presence and the richness of his language.

It is to be regretted that this learned work of Mr. Willis could not have been published in 1897 as was originally intended. Circumstances have caused the manuscript to slumber for four years before seeing light, and when the moment came for printing it the author evidently found himself hurried. The recital ends a little abruptly, and after having informed us so fully in regard to the earlier events it passes too rapidly over recent occurrences. This defect in proportion is very noticeable when one comes to chapter XIX, and the author will pardon us for pointing out in the last line of this too

brief chapter an actual error. He says there: "Until France shall change her position there can be no thought of a new régime; of the improbability of such a change the unfavorable reception in Paris accorded to the bimetallic commission sent out by President McKinley affords evidence." The reference is to the final effort made by Mr. Wolcott and his colleagues, Gen. Charles J. Paine and Mr. Adlai E. Stevenson. These gentlemen were possibly received with some suspicion by the business world where the joint action which they urged on France was considered very inopportune and even somewhat wild. But of what could they complain? The president of the council of ministers was then the honorable M. Jules Méline, whose blindness in monetary matters was only equaled by his good faith, and who, deaf to the remonstrances of his wisest advisers, did not hesitate to promise the American delegates the absolute concurrence of the French diplomacy, and the French ambassador at London, it is said, was compelled to join personally in the manifesto which Mr. Wolcott was about to present to the British government. If England at that time had only guaranteed the reopening of the Indian mints, France would have been taken in the snare. In fact, the Bimetallic League was already exultant, and its fiery leader, M. E. Théry, ostentatiously wagered M. Yves Guyot that within a year the unconditional restoration, of the ratio of 15½ to 1 would be an accomplished fact. O, fond delusion! His mistake cost him only a breakfast of a dozen covers where a libation of 15½ bottles of generous champagne accompanied the funeral rites of bimetallism, at last abandoned to its fate.

A final chapter, in which statistics are given free scope, deals with the important question of the stock of silver écus existing in France and the other countries of the Latin Union. There I shall be tempted to find fault with the extreme impartiality for which I just now praised Mr. Willis. He places side by side before the reader, leaving to him all the embarrassment of choice, the estimate of M. Ottomar Haupt and my own, which differ entirely. As he has himself shown the importance of this statistical problem, I would have been pleased had he explained, at least briefly, the two methods which led to such different results. M. Haupt bases his estimate solely on commercial statistics, which, as far as they concern silver and gold, are on their own confession entirely unreliable. The method of which I was originator has truly a more solid basis, and since the death of M. Haupt no one in France believes in the three or even

four milliards which he has so generously bestowed on us. France, I dare assert, does not retain two milliards in silver écus, including those of foreign coinage. I do not overlook the fact that our French mints alone, during the century just ended have issued, in écus, more than five milliards (exactly 5060 million francs). But under Louis Philippe (1830–1848) and again since his time, private enterprise has melted up many more écus than speculation has exported. Why? Because the progress of chemistry has revealed that under Napoleon, and even under Louis XVIII. there was put into the white coins without anyone knowing it, a little more silver than the law required (.903 on the average instead of .900), and also a little gold (0.8 per 1000). When silver bullion commanded a premium on the market the remelting of the five-franc piece, especially a heavy one, by aid of the new methods which science had put at the disposal of the refiners, could give two or three sous profit, and some considerable fortunes were thus gained.

This is how it happens that of the five milliards coined in French écus from the end of the eighteenth century until 1878 scarcely one and a half remained there in 1897. Then came the convention of October 29, 1897, of which Mr. Willis is not ignorant,[1] but which he was unable to follow to its conclusion. This treaty, which increased by 130 million francs our quota of fractional currency obliged us to use for this new issue old écus remelted for that purpose. Indeed, there has already been officially destroyed about 100 million francs of these large silver pieces bearing the image of Napoleon I., Louis XVIII., Charles X., or Louis Philippe.

Marvel at the irony of fate and the blindness of man! At Brussels, or elsewhere, when the demand was made that France should still sacrifice her own interests to rehabilitate silver, she replied that for twenty years she had continually protected against any depreciation an enormous stock of silver money, and that the other states of Europe were far from being able to say as much. This argument has more than once closed the mouths of our adversaries. We can no longer say this, since even in Paris the remelting of the écus has begun in accordance with the terms of the convention of 1897. Furthermore, the ministry which has thus given the *coup de grâce* to the silver standard

[1] The only diplomatic act concerning the Latin Union of which Mr. Willis makes no mention is the protocol of March 15, 1898, relating to the fractional currency of the kingdom of Italy.

without any real necessity, is the same Méline ministry whose chief showed himself ready for the worst acts of indiscretion for the sake of the greater glory of bimetallism.

The compulsory remelting of which I have spoken is not the only factor to lighten the burden of our stock of écus. The French administration periodically sends silver coins to our various possessions in Africa, especially Madagascar, and this silver never returns. Our situation in this respect will better itself gradually, and I, for my part, consider it less harmful, less disturbing, than Mr. Willis believes it to be. When he expresses the opinion that the Latin Union has proved a failure for those who formed it, he is right in a general way. However, our monetary system, since 1885, has not failed to bring us certain political advantages. The dissolution of the existing union would be less menacing to our finances than to those of Belgium and Italy. And as they well know this, it is a motive for maintaining a friendly attitude toward France. The pervading thought of Mr. Willis is that we shall never be able to recover our freedom of action. In one of the last pages of his remarkable monograph he says: "The Latin Union is doomed to existence in its present condition for an indefinite period." He need not pity us where we do not pity ourselves! Upon the whole for twenty years our monetary policy has often been wiser than that of other states which I could cite. And time, the great master, works for us rather than against us.

ALFRED DE FOVILLE.

PARIS.

OUR NEXT MONEY CONTROVERSY.

RECENT events have emphasized the necessity of a revision of our money and banking systems. The latter, in the words of Mr. Stickney, is no system at all, but simply a group of banks bound together by a very slender thread.[1] There has been a decrease in the national debt, and a piling up of a surplus which it is now proposed to use to still further reduce the government obligations, which must result in a decline in the amount of bonds now used for national bank circulation. In this connection a number of suggestions have been made for the modification of the National Banking system, and in some instances an entire repeal of the National Bank Act asked, in the hope of securing a complete and adequate system of banking.

[1] Speech at Milwaukee, October 16, 1901.

It is proposed that an asset bank currency shall take the place of the present national bank note. In this connection Mr. Stickney's suggestion for a central bank and branches, issuing notes upon commercial assets, has received wide discussion. But a question arises here, political in character, that will modify very decidedly the whole matter of banking currency. That question may be put in this way, Will the people stand for an increased banking currency in the face of the so-called high value and usefulness of the greenback? That this question is not academic, but actually pressing, is indicated in an editorial in the *Chicago Tribune*,[1] which says: "The people have full faith in the $350,000,000 of national bank notes now outstanding. They are secured by government bonds. But if the national debt shall be extinguished and no bond basis remain for bank notes, then the bank will have to cease issuing notes. The people would have more confidence in one thousand millions of greenbacks based on the unfluctuating value of gold in the treasury than in $350,000,000 of bank notes, based on the fluctuating value of bank assets. These assets are made up in part of securities and of industrials, which are above par one day and near zero the next day."

The writer of the editorial has failed absolutely to understand the full meaning of commercial assets, or the true basis of the banking proposition. Canada and Scotland, and Germany to some extent, have not found a currency based on assets to be such a fluctuating one as indicated in the editorial. In fact, there is nothing sounder than true commercial assets for bank notes, viz., the business transactions of a community. The writer has also evidently forgotten that a system of bank notes issued on assets would be accompanied by a provision for a guaranty fund and a system of redemption. He seems to think that the notes would remain outstanding just as the greenbacks do at the present time without redemption, except under panicky conditions. That gold, the reserve of the greenback, is difficult to secure at such times, is also lost upon the writer of this editorial.

The editorial, however valueless it is as a scientific suggestion of what is needed in the United States as a true money system, nevertheless indicates that a very wide-spread opposition exists to a further enlargement of bank note issues on any basis. This supposition is borne out in the attitude of the Illinois Bankers' Convention at Quincy, held recently. In this convention it was manifest that the bankers

[1] Quoted from *Commercial West*, November 2, 1901.

were by no means agreed as to the value of a currency-issue on banking assets. One of the oldest bankers in the state, discussing the matter, said :

> We are living under systems of banking both national and state which have been tested as far as it has been permitted, and found to be both useful and safe. It is probable that these systems, as excellent as they are now thought to be, can yet be improved. But in attempting to do this let us not lose sight of the past principles and past experiences, and whatever we attempt let us take no chances of bringing about the return of the days when wildcats, red dogs, and stump-tail currency inundated the country to the great loss of the people.[1]

The president of the Bankers' Association following the speaker quoted above stated :

> We may well study the lesson taught in the American Bankers' Association at Milwaukee in the addresses of Mr. Gage, Mr. Stickney, Mr. Eckles, etc. While some may not be willing to endorse all the methods recommended, it was a fearless and able occupancy of advanced courses, and will honor the men who blazed the way. It seems to me that the crying needs of the day are the gradual retirement of the greenbacks, the abolishment of the subtreasury, and an elastic system.[2]

Although the two addresses quoted above do not oppose directly the issue of bank notes on commercial assets, nevertheless it can be easily seen that there is no enthusiastic acceptance of a different method of issuing bank notes than that already in existence. Bankers are so well satisfied in many instances with the present system, and are so conservative that they hesitate to recommend anything that would tend to disturb the existing system. But it is very decidely a question whether at the present time we are not simply holding off the entire issue. In 1896 the people of the country settled fairly well the question of monometalism. But there still remains to be determined a much greater question, viz., the continuance of the greenbacks, and the issue of bank notes in company with a decreasing national debt. What are you going to put in their places ?

In this connection Mr. Eckles, the ex-comptroller of the currency, in a speech before the Chicago Bank Clerk's association, said :[3]

> It is not good economics to keep up a national debt, the interest on which must be paid by taxes from the people for the sole purpose of affording a

[1] Quoted in *Commercial West*, November 2, 1901. [2] *Ibid.*

[3] Speech made October 22, 1901.

basis of circulation. We might keep our present bank-note circulation so long as the bonds outstand, but allow a percentage of bank notes in addition, regulated by a tax, and with a safety fund and proper redemption agency. Thus asset bank notes would be equally responsive to the varying interests of business at difficult seasons. For a time we might allow their use only in emergencies. We must reach asset currency by evolution, not revolution, as Mr. J. B. Forgan stated in a very able paper he read at the Bankers' Club the other evening. I feel confident we will see asset currency in this country some day. It will make a scientific substitute not only for present-day bank notes, but for our unsound and costly greenbacks, and for our silver certificates, which are nothing but warehouse receipts for a lot of poor silver stored away in a cellar somewhere in Washington.

The objections to the national bank currency may be summarized briefly as follows: First, the basis is a constantly narrowing one, decreasing as the national debt grows smaller. The answer to this objection is that the national debt is likely to remain as large as it is, and possibly even to increase, but when you remember that at the present time the total surplus for the year 1900 was 80 millions of dollars, it is difficult to reconcile the two statements. The second objection is the inelasticity of the system. The law of March 14th, 1900, modified to some degree the inelastic features, making it possible for a bank to secure an increased currency by the deposit of bonds without waiting a period of six months. But even now it is necessary to buy the bonds, send them to Washington and order your circulation, which takes from three to four weeks as a usual thing. Further than this it is inelastic in that the amount of bonds is limited. Third, in new communities the banks fail to increase their circulation beyond the minimum amount required by the law. The reason for this is that the capital tied up by the bonds can be used to better advantage by loaning it to borrowers. As a result new communities, where there is a good profit from interest on loans, find it difficult to secure the necessary banking currency. The bankers object to furnishing it under present conditions on the ground that it gives them no profit. This statement is borne out by the secretary of the treasury when he says that the net advantage to a banker issuing notes on 2 per cent. bonds is 1.5 per cent., on 3 per cent. bonds of 1908, a profit of .15 per cent., on 4 per cent. bonds of 1907, a profit of .12 per cent., on 4 per cent. bonds of 1905, a profit of .15 of one per cent., on 5 per cent. bonds of 1904, a loss of one-half of one per cent. These figures are

sufficient to maintain the contention of the banker. The problem must be met some way.[1]

Mr. H. D. Baker, in discussing this subject in the *Commercial West*,[2] indicates very clearly the difficulties of the problem.

> The framers of the new currency law, in order to postpone the day when the country will have to choose between currency based on bank assets, and a currency consisting wholly of greenbacks or silver certificates, inserted, with the cleverness of a lawyer who wants to keep his case from going to trial, a refunding provision in that law. The 4 per cent. bonds of the government, which were to mature in 1907, amounted to 553 millions of dollars; the annual interest amounted to $22,120,000. In the life time of these bonds, which would have been eight and one-half years, the interest would have aggregated 188 millons of dollars, but by the refunding operation which converted these bonds into a class having a life of thirty years, and paying 2 per cent. interest, the aggregate amount of interest payable before maturity mounts from 188 million dollars to 331.8 million dollars. On this batch the loss was about 143.8 million dollars; on 3 per cent.'s of 1908 a loss of 65 million dollars, and on the 5's of 1904, about 34 million dollars. The aggregate loss on these three was something near 243 million dollars. This, of course, assuming that none of the bonds would be returned before maturity.
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> The sum of 240 million dollars was a vast sum to plan to pay in order to cause a postponement for thirty years of an unpleasant public dilemma. The fact was that the framers of the law were willing to see the public pay 240 million dollars in order that a final overhauling of the currency system might be delayed for thirty years; yet because of the retirement of bonds necessitated by the surplus and the sub-treasury system, the ugly problem connected with the overhauling promises to forcibly loom up sooner than was anticipated. Only a foreign war and a panic requiring special protection of the gold reserve, or a general policy of national extravagance, can occasion the further bond issue needed to keep these questions in the stage of mere academic discussion.

The whole drift then of the discussion and agitation is in the direction of a different system of banking from the present one. Is it wise to depart from what has already been established and enter into a new field of organization, or is it better to modify the present system by some additions from the new?

In this connection it must be remembered that the right to issue notes on commercial assets must be extended to state banks as well as to national banks. There are something over 4,000 national banks, the number of state banks is still larger, making in the neighborhood of

[1] *Report of Secretary of the Treasury, 1890*, pp. xxxiii–xxiv. [2] Nov. 2, 1901.

9,000 banks engaged in business in the United States. To permit these banks to issue notes on commercial assets must be attended by much danger and great difficulty, and any movement toward asset banking must in its very beginning present some means of avoiding over issue, and in consequence, depreciation of bank notes. It has been proposed to create a central bank with branches, making it possible to use the capital of the central bank, where large assets and resources have been piled up, as the banking capital of the different branches. Such a bank must be either organized by the government or by private individuals. In the first place you would probably have one central bank; in the second, many large banks engaged in so-called branch banking.

Undoubtedly out of the question is anything like a public central bank controlled by the government. The political element that comes into the issue of greenbacks and the maintenance of the gold reserve would predominate even to a greater extent in the organization of a government central bank. The argument to the effect that such a political element is absent from the banks of Germany, France, and England is out of order in the United States, in that the governments named are very different in organization and in power. In the United States the people by their ballots determine in a rough way the policy of the government, and it is very decidedly a question whether they can be relied upon to let a public central bank alone after it has been established. We must therefore rely upon the organization of private central banks if we are to have such a form of banking, and many objections might be urged against a system of that kind. The arguments for a central bank are briefly that the large deposits and vast amounts of specie, now stored in the great banks of the financial centers, would be distributed through branches at the points where capital is most needed, and that there would result as a consequence a building up of commercial relations which cannot now be brought into existence because of the failure of banks to serve the people.

The second argument is the regularity of the currency supply, and the ability of a bank of that kind to gauge accurately the needs of a community for money. Both of these arguments may be granted without further discussion. Nevertheless the question arises, are we ready for a complete system of asset banking, and of the establishment of large central banks in different parts of the country? Certainly it can be urged that such a system scatters reserves over a great territory,

subjecting them to many varying conditions of climate, community, crop returns, and industrial situations, and that the danger of possible failure is therefore greater than under the present system.

Is it not possible, however, to modify the present system in such a way as to secure all of the advantages that come with a banking organization well established? It is stated further that under proper conditions and to a limited degree, branch banking may be permitted to national banks; and second, in order to increase the circulation and its elasticity, permit national banks to issue notes to the extent of 150 per cent. of the bonds deposited by them, under a tax of 3 or 4 per cent., thus making the additional 50 per cent. a sort of emergency currency that can be used in times of difficulty; third, a guarantee fund to protect the additional 50 per cent. of notes, this fund to be based upon some such scheme as that of the New York banking system of the 30's. Fourth, the present redemption system needs enlargement, not abolition, to make it adequate. National bank notes are not lawful money, and cannot be held as reserve required by law. As a result, during those seasons of the year when the movement of currency is toward New York, the banks sort out the national bank notes and send them to Washington for redemption. Here is the very important point of superiority over the greenbacks. The latter remain stationary, and no process of redemption other than that of exchange of gold from the treasury is carried on, and consequently there is an accumulation at the financial centers, producing abnormal credit conditions and stimulating speculation. Since the act of March 14, 1900, the redemption of national bank notes has increased very materially. The total of national bank circulation March 1, 1899, was $242,989,082, and on March 1, 1901, $348,655,256, an increase of about one-third in average outstanding circulation. But at the same time the redemption of bank-note currency has increased about 66 per cent. In this connection one writer says:

> Fortunately the ready response of our present system to the increased strain of the past year indicates that it will be found adequate for a still greater activity. A mere increase in the force engaged in counting and sorting notes at Washington would probably enable the agency to handle several times the present volume of business . . . . It is quite probable that if we ultimately secure a bank-note currency based on commercial assets, and thus automatically responsive to business needs, the activity of redemptions may even approximate that of Canada and Scotland, where the entire currency is

redeemed once a month. If so, it is reasonable to expect that a system of redemption through clearing houses or other bank agencies will be developed For the present, however, we need have no fear that the existing system will not properly guard against any material redundancy, so long as the national banks preform their part by keeping bank notes separate from other forms of currency and sending them in for redemption whenever there is no profitable employment for them.[1]

It would seem then from what has been said, that we have the basis of a better system than exists at the present time. What is needed, therefore, is careful legislation introducing a commercial asset system of bank note issue, an enlargement of the redemption agency, and an establishment of a guaranty fund for the increase of bank notes. Such a system would certainly offset the tendency toward the decrease in national bank notes and maintain their proportion in the present system of currency.

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[1] L. C. ROOT, in *Sound Currency*, vol. viii. No. 1, p. 64.

BOOK REVIEWS.

L'essor industriel et commercial du peuple allemand. By GEORGES BLONDEL. Troisième édition refondue, mise au courant et augmentée. Paris: L. Larose (Bibliothèque du musée social), 1900. 12mo, pp. xx + 502.

IN his excellent *Studies on the Rural Population of Germany and the Agricultural Crisis*,[1] the French economist, Georges Blondel, endeavored to familiarize his countrymen with the agricultural conditions of the German empire. He has since undertaken to study its manufactures and commerce. The results of his investigations were first read by him before the "Musée social" in Paris, in December, 1897. He published this address in 1898 in enlarged form in a little pamphlet of about 200 pages, under the title, *The Industrial and Commercial Rise of the German People.* At the request of the "Musée social," he again went back to Germany, and as a result of this new trip the second edition, published in 1899, was twice the size of the first. The third edition of 1900 is a volume of 500 pages.

Mr. Blondel begins with a description of the attention paid in late years in England, Russia, and France to the increasing competition of the German manufactures and commerce. He shows that, while in the year following the Franco-German war the foreign commerce of France considerably surpassed the German, Germany began to take the lead in 1877. He points to the fact that, about 1840, France had as many inhabitants as Germany; to the difference in the subsequent increase of the population of both countries; and to the great increase in size and number of large cities in Germany, and of the number of workers engaged in German industries and commerce. After this general view, he treats (pp. 36–114) some of the leading German industries. He thus takes up mining, foundries and machine-shops, the electrical industry, the textiles, the chemical and agricultural

[1] *Études sur les populations rurales de l'Allemagne et la crise agraire*, par GEORGES BLONDEL (1897); translated into German as: G. BLONDEL, *Die landwirtschaftlichen Zustände im Deutschen Reiche.* Nach dem Französischen bearbeitet von Ahn und Möllendorff. (Cologne, 1899.)

industries; he touches lightly, also, upon the clothing industry, china and glass-making, the manufacturing of furniture, toys, musical instruments, and the paper and leather industry.

In a second chapter he investigates the commercial rise of the German empire. He discusses briefly (pp. 116–135) the development of internal trade by railway, rivers, and canals, and treats to a considerable extent (pp. 135–271) the foreign commerce. After having briefly touched upon the projects of international canals, he subsequently takes up the development of the commerce of the ports, of the construction of mercantile ships, the navigation lines, the navy, and the colonial undertakings. But his treatment of the German exports and imports is somewhat superficial, his statements with regard to the commerce with Russia are contradictory, and his figures for the trade with Mexico are wrong, as are also some regarding the United States. The same may be said about the diagram which he gives later (p. 452) for the total imports and exports of the United States. However, aside from these and a few other errors, this chapter gives a good general survey of the foreign commerce of Germany, especially regarding the progress recently made in Asia and South America.

After describing the industrial and commercial rise of Germany, Mr. Blondel treats in a third and very interesting chapter (pp. 272–374), the causes of this rise. The traits of character which, according to him, have especially effected the present economic strength of Germany, and the lack of which has kept the French back, are the expansive character of the Germans, which has manifested itself in their colonizing central Europe and in their emigrations, and their spirit of association. Among other qualities which the German has and which the Frenchman lacks, he especially mentions his tenacity, his love for the industry he pursues, his interest in economic questions. He also points to his investigative character, his patience, his hard working, his moderate needs, and his retaining of his nationality. The second of the reasons explaining the economic rise of Germany he declares to be the eminently practical education given to the German youth. He describes the technical, trade, and commercial schools, the permanent industrial expositions, the depots of export samples and bureaus for commercial information, the museums of industrial art, the fairs. He especially dwells upon the application of science in German industries, the knowledge of language among

Germans, their extended and methodical traveling. Character and education, however, he says, are not the only causes which explain the industrial and commercial rise of the German people; the action of the government is a third factor. He describes the solicitude it has exhibited for commerce by the reorganization of the chambers of commerce, the improvement of the consular service, and the encouragement given to technical, trade, and commercial schools, and gives a very lucid account of the commercial and tariff politics of the German empire compared with those of France since the Franco-German war.

In a fourth chapter (pp. 375–402) he treats the causes of the inferiority of France. He sees the main reason for the small progress of its foreign commerce in the stagnation of the population, another in the narrow and inadequate methods of the French merchants in conducting business with foreign peoples. He also thinks that the protective system adhered to by France is partly responsible for the stagnation of its foreign commerce. He especially dwells upon the necessity of a change in the French system of education; it should, by laying more stress upon the industrial and commercial instruction, better prepare the young man for practical life; it should turn towards manufactures and commerce a part of the intellectual strength of France, which at present flows almost entirely to the professions and to official positions, and should tend toward increasing the spirit of initiative and responsibility in the youth. In his conclusion (pp. 403–412), he points to the detriment ensuing to the French people from its political party quarrels, but finishes after all by exhorting his countrymen not to be discouraged.

Mr. Blondel devotes a large appendix (pp. 413–484) to various special topics. He reproduces some statistics of the world's production of coal, describes the trip of William II. to Palestine, and the progress of the Germans in the Levant, the occupation of Kiautschou and the intervention of Germany in the extreme Orient, the commercial relations of Germany and the United States, and the rôle played by banks in the economic life of Germany. He gives, finally, in a few additional notes (pp. 485–498), some statistics for the year 1899.

There are two drawbacks to Mr. Blondel's book which I wish to mention. The one is a direct consequence of its development from a short paper; there are parts which are a mere collection of notes and quotations not always showing a proper regard for systematic

arrangement. The other is that, as he himself acknowledges, he depends to an almost too great degree on secondary sources. He thus quotes the census figures of the industrial population in 1882 and 1895 from the report of an ambassador. The consequence is that this table (page 27 f.) is full of mistakes, partly perhaps only misprints. These drawbacks have to be criticised the less severely as the author characterizes his book as a "simple sketch." He announces the intention of publishing soon a detailed description of the economic and social transformation of the German empire in the last quarter of the nineteenth century. In view of his clear and impartial judgment, and his stupendous knowledge of the widely scattered literature, which he already displays in the book just reviewed, every student of the subject may look forward with interest to the execution of this plan.

ROBERT RENÉ KUCZYNSKI.

WASHINGTON, D. C.

Handel und Wandel. Jahresbericht über den Wirtschafts- und Arbeitsmarkt. Für Volkswirte und Geschäftsmanner, Arbeitgeber- und Arbeiterorganisationen. Jahrgang, 1900. Herausgegeben von RICHARD CALWER. Berlin–Bern: Akademischer Verlag für sociale Wissenschaften, 1901, 8vo, pp. 240.

THIS is the first number of an annual which the editor intends shall contain a survey of all the fields of economic activity in Germany, sufficiently detailed for purposes of orientation. In it the legislator, the economist, the practical business man, and the laborer are to find the information necessary to judge fairly the economic questions by which they are confronted. Such is the intention expressed in the preface.

Little encouragement is given, however, to the exercise of independent judgment on the part of the reader. Indeed the book is really little more than a monograph by Herr Calmer on economic conditions in Germany. It contains a large mass of useful information collected from sources usually trustworthy, and from this information the writer draws his own conclusions and seldom hesitates to give them emphatic expression. In some cases the reader will find it easy to agree with him, in others his opinions will seem biased or founded on insufficient evidence.

The writer points out that the continued prosperity that had been enjoyed for several years in nearly all branches of industry and commerce ended in 1900, and a strong reaction set in. He believes the depression was due wholly to the inordinate enlargement of German enterprises and the resulting overproduction (pp. 20–28). The attempt to prove this is the main purpose of the review which follows, of the leading industries and of the labor market. The evidence adduced, however, is not convincing. For it seems to us that the writer underestimates the influence of foreign competition — especially the growing competition of the United States. Nor does he sufficiently allow for the disastrous effects of the coal-miners' strikes, of the political troubles in South Africa and China, and of a series of other causes that might be mentioned.

But even though one may not always agree with the "editor," this first number of his annual will still be found usually interesting, frequently instructive, and always suggestive. A specially useful feature of the book is formed by the statistical tables given in the appendices.

T. W. PAGE.

Studien zur östereichischen Agrargeschichte. Von KARL GRÜNBERG. Leipzig: Duncker und Humblot, 1901. 8vo, pp. vi + 281.

THE three essays that make up this little book form a valuable contribution to the economic history of a part of Europe whose development merits more attention than it has received. In his account of certain phases of this development the author takes the attempted reforms of Joseph II. as a point of departure. He describes the conditions that made reform seem necessary to that "lonely antagonist of destiny," points out the obstacles against which the movement for reform was shattered, and accounts for the continuance of the policy, *quieta non movere*, until 1848. In the intricacies of Austrian legislation and the long discussions of proposals that came to nothing, the reader is in some danger of losing sight of the really controlling forces. Indeed, the book is rather a study of certain lines of agrarian legislation than studies of general agrarian history. For all that, it contains much information about the condition and customs, as well as the legal position, of the rural classes.

The first essay discusses the abolition of slavery and serfdom in Bukowina. This little province when ceded to Austria in 1775 had a

population of about 75,000. Of this number something less than 2500 were gypsies who were held in slavery as absolute as that then prevailing in our southern states. The majority of the other inhabitants were serfs whose predial services were light, because, owing to the backward condition of agriculture, there was little demand for their labor, but who were bound to pay to their landlords a tenth of all their produce. The Austrian government made various attempts to substitute freedom for bondage. The slavery of the gypsies was indeed abolished; but the serfs were little benefited, partly because the government found it necessary to conciliate the landlords, partly because it failed to understand the customs that prevailed in the province. It was not until 1835 that the land of the peasants which was held in common by the village inhabitants was divided and assigned to individual ownership; and not until 1848 that the services due to the landlords were abolished and compensation promised to those entitled to demand them, a compensation which the state was eventually bound to assist in paying.

The second essay relates to the restrictions that existed in Bohemia on the purchase of land. These were abolished by Joseph II. in spite of the bitter opposition of the nobles, who saw the economic basis of their existence as a class gravely threatened if the bourgeois and peasants were permitted to hold *herrschaftlicher Grund und Boden*. The writer shows that — contrary to the impression heretofore prevailing — under the system of freedom thus established no great amount of land passed out of the ownership of nobles into that of members of the other classes. Social and political conditions rendered it out of the question for the peasants to discharge the judicial and administrative duties that constitutionally devolved on the owners of such land. After Joseph's death his policy was abandoned, and there was a return to the ancient customs, which prevailed with no important alteration until the Revolution of 1848.

In the third essay the writer takes up the law of inheritance and the restrictions on the subdivision of peasant holdings that prevailed in Austria before 1868. About a generation ago Joseph Unger pointed out that the old Austrian legislation in regard to the inheritance of peasant holdings was in no respect different from the common law. This opinion was accepted, however, neither by contemporaries nor by later writers and statesmen. An extensive study of original sources of information enables our author to show that Unger's opinion was quite correct, except with regard to Tirol and

Vorarlsberg. In doing this he has thrown a great deal of light on the motives and agrarian policy of the Austrian government since the time of Maria Theresa and likewise upon the social and economic condition of the lower classes of the people.

T. W. P.

The Confederate States of America, 1861–1865: A Financial and Industrial History of the South during the Civil War. By JOHN CHRISTOPHER SCHWAB, A.M., PH.D. New York: Charles Scribner's Sons, 1901. Royal 8vo, pp. xi+332.

MANY volumes have appeared treating of the reasons for the conflict here dealt with; of the military and political methods employed by the leaders on both sides; of the political and constitutional results; of the financial policy of the North. Professor Schwab's treatise presents for the first time a view of the peculiar economic conditions existing in the South at the beginning of the war and resulting from its continuance, as well as a study of the financial policy pursued by the central government and the several states of the confederacy.

Professor Schwab treats this subject as a study in "anomalous economic conditions," a picture presenting "the negation of normal economic forces," by the condition of war itself, which wrecked the pre-existing industrial organization; the blockade which forced upon the South an economic isolation, "depriving her of all the advantages that modern international trade and credit relations might have offered, and compelling her to revert to earlier industrial forms;" and by the mistaken monetary and financial policy pursued by central and state governments, which led to the destruction of such credit as they possessed at the opening of the war, to inflation of prices, and to financial disaster.

The course of this mistaken financial and monetary policy is traced in detail, and analogies are instanced at every step between the policy here presented and similar action taken by the United States government during the wars of the Revolution and of 1812; by the French during their revolution; by the Italian government at different times, and even by the Chinese government centuries ago. Comparison is also made, though less often than might be desired, with the action of the Federal Congress during the same period, and the policy of Secretary Chase.

Interest centers chiefly about the relation existing between the loan and tax policy in the effort to secure the wherewithal to carry on the war; the monetary policy; and the effect of the war on the development of industries in a region where agriculture had so largely prevailed.

The financial legislation and that regarding taxation is treated of in five chapters, the first four chapters being devoted to the former subject, the single chapter on central and local taxation being strangely enough put at the end of the treatise.

The financial policy, based almost wholly on resort to credit, was inaugurated February 28, 1861, when a loan of 15 million dollars was authorized by the provisional congress. This sum was to be issued in bonds bearing 8 per cent. payable in ten years and redeemable in five at the pleasure of the government by giving three month's public notice. A special duty — a small export charge on cotton — was pledged to the payment of this issue. With the results of this loan, which was quite successful, the funds seized from the United States mints and customs houses, *i. e.*, about one million dollars, and the contributions freely made to the cause, the conflict was begun. The issue of treasury notes began March 9, 1861, and by August of that year the government was committed to a paper money policy. Secretary Memminger, like Secretary Chase, failed to appreciate the duration and severity of the struggle for which it was his duty to secure the means, or of the necessity of immediate and vigorous resort to taxation. Professor Schwab implies that public sentiment on the subject of taxation in the South was behind that in the North, so that, of the two, the southern secretary was the less to blame.

One interesting difference is to be noted. The confederate government did not go to the extent of making its notes a legal tender. Such action was proposed and debated again and again; but the arguments urged in vain in the federal Congress during the winter of 1861–2 against such action prevailed in the South. The arguments which prevailed in the North were urged in the South, with one exception — an appeal to the "general welfare" had been prevented by an alteration in the constitution adopted by the confederacy, by which that dubious clause was omitted. The conflict itself was the outgrowth of the "strict construction" theory, and the influence of that theory prevailed. Some of the states, as Alabama, made contracts thereafter entered into payable in confederate notes; but in other states such

legislation, when proposed, was either rejected or vetoed as being in violation of the provision that states should make only gold and silver a legal tender. Harsh measures were resorted to by individuals and by authorities sometimes to influence individual action by the force of public opinion; but it may always be put down to the credit of the confederate government that it did not go to the extreme marked by the legal tender act of February 25, 1862, of the federal Congress.

The policy inaugurated during the first year was continued during the entire war; its features were: a minimum use of taxation; loans proposed, but failing because inadequately sustained by taxes; and finally a despairing return to treasury notes. Only at the end was there a recognition by Secretary Trenholm of the blunder, and a fruitless attempt made to resort to taxation as a basis for the credit now hopelessly destroyed.

Professor Schwab's treatment is uniformly sympathetic; yet he presents this course from the view-point of the present rather than of that day. The blunders seem in his presentation so obviously blunders that one wonders at the blindness of the leaders, and his closing statement comes as a surprise — "The history of Europe, and especially of the United States, indicates that no statesman or body of statesmen could have devised means of carrying on the war without recourse to such arbitrary and disturbing fiscal devices."

It would be interesting to review the narrative with regard to currency expedients, the fiat money notions prevailing, the issues of notes by local units of government and private corporations, the resort to barter, the rise of prices, the attempts of government to control prices, etc. These have all a familiar sound as expedients resorted to in the other wars enumerated, but the old expedients gain new interest with each example of faith in their efficacy.

As to the development of industry, Professor Schwab finds that the effect of the war on mining and manufacturing industries was slight. Those industries connected with the supply of arms and ammunition were encouraged, but seem not to have gained a permanent foothold. Cotton and paper mills were established, and various forms of manufacturing were attempted, but did not pass beyond the point of experimentation, because of the lack of capital and skilled labor. The railroads suffered enormous losses. Agriculture was injured by the ravages of war, by the effects of the blockade which shut off the foreign and northern market for tobacco and cotton, and by the mistaken policy of

the authorities as to impressment and fixed prices of supplies for the army, which discouraged such cultivation of the land as might have gone on even under the conditions of war.

In spite of the scarcity of material and difficulty of access to the sources, or perhaps because of these obstacles, Professor Schwab's treatise is a most valuable narrative of the struggle from the industrial, and more particularly from the financial point of view. The reader sometimes wishes that the space occupied by the innumerable comparisons might have been given to human touches of explanation which would have explained the lack of financial leadership, contrasting with the brilliant military records. Sometimes, too, there is a suggestion of the mechanical in the succession of citations in cases where similarities were so great that to refer to differences — as in the case of the policy adopted by the several states with reference to the same question, would have given greater clearness to the narrative. But these are small and carping criticisms of a faithful and sympathetic presentation which should be heartily welcomed by the student of this the crucial period in our country's history.

S. P. BRECKINRIDGE.

Reconstruction in Mississippi. By JAMES WILFORD GARNER. New York: The Macmillan Co., 1901, 8vo, pp. xiii+422.

THIS presentation of "a period too little studied as yet and of capital importance in our constitutional history" is a timely one, and an illustration of the statement ventured recently that "even the period of the reconstruction can now be judged fairly enough." In view of late constitutional and political developments in many of the southern states by which, it is believed, the work of reconstruction is being undone and its effects nullified, such a study has peculiar value. In interpreting such phenomena, answers must be sought to the questions: What was attempted by the reconstruction policy? Wherein did that policy succeed temporarily? Which of its results have stood the test of a quarter of a century, to be then, perhaps, overthrown?

With reference to one state, Mississippi, taken as illustrative, the writer has supplied answers to these queries in a discussion which is dispassionate and scholarly and at the same time most sympathetic.

Politically, interest centers in the causes leading to the substitution

of the "congressional" for the "presidential" policy of reconstruction; the relation of the military to the civil authorities; the admission of the freedmen to the electorate; the readmission of the state to the Union under humiliating conditions; the subjection of the state to government by "carpet-baggers," "scalawags," and freedmen; and the "revolution of 1875," leading to the expulsion of the carpet-bagger, the rejection of the scalawag, and the relegation of the freedmen to a subordinate position in the political life of the state.

Economically, the situation was scarcely less dramatic. Its important elements were the destruction of all material forms of wealth by the ravages of war; the destruction of labor force through the effects of military service on both races and of emancipation on the colored man; the enormous burden of taxation laid by the Federal Government and the extravagant administration of state authorities; and the readjustment of the labor system growing out of the substitution of free for slave labor. Each of these items receives intelligent treatment.

For the student of general social development, the chapters devoted to "Educational Reconstruction" (X), the "Kuklux Disturbances" (IX), and the "Freedmen's Bureau" (IV) will have a special interest.

The excellent construction of the volume from a mechanical point of view may well be noticed. The main discussion shows an admirable self-restraint; while the multitude of footnotes and references not only indicate the thoroughness with which the sources of information have been utilized, but add information of a social, personal, and local character, such as to illumine the subject and intensify the interest of the matter presented.

S. P. B.

Beiträge zur Geschichte des Judenrechts im Mittelalter (mit besonderer Bedachtnahme auf die Länder der österreichisch-ungarischen Monarchie). Band I. *Die Rechtsverhältnisse der Juden in den deutsch-österreichischen Ländern.* By DR. J. B. SCHERER. Leipzig: Duncker & Humblot, 1901. 8vo, pp. xi+671.

THE present volume begins with a lengthy introduction wherein are discussed the principles which during the middle ages governed general European legislation about the Jews. The author then goes on to his chief subject, the legal conditions of the Jews in Upper and Lower Austria, and to this he finally attaches a survey of their situation as well in Styria, Carenthia, and neighboring provinces under the

Austrian crown. The book is written with no attempt to narrate pleasantly or to show any "style;" it is rather a summary of laws passed upon the relations between Jews and Christians, with short explanations or remarks as the subject may demand. The large material, however, faithfully recorded makes it a very useful volume to the student of mediæval conditions, and the laws in their graphic sternness are really narrative enough. They stand out as sinister mileposts on the long and stony road of the unhappy foreigner and stubborn denier of the divinity of Christ. The book, of course, mainly treats the political situation of the Jew, but interwoven with this are enough of instances which throw light upon his place as an economic factor. This was a phase of no mean importance, since it was his fate to introduce among a stupid and backward population methods that were far beyond their appreciation and must necessarily have clashed with their primitive notions and undeveloped practices, based as these were entirely upon husbandry and natural economy, with no conception whatever of large industries or rapid exchange. The political situation of the Jew is copiously illustrated by reference to the royal letters and privileges and to the decrees of the church councils, which together picture the basis on which the life of the Jew in European society was founded, a basis barren enough of security, and allowing mostly only a life passed in suspense; the economic situation, of course, is largely an outcome of the political.

The Jew as a money agent, his precarious existence as an object of constant greed and hatred because of his exclusiveness, the mystery which surrounded his actions, since no one could follow or understand his dealings with his brethren in the true faith, dealings so full of absolute trust and solidarity of interests that large sums were conjured into light upon a mere signature, and therefore, as the outsider argued, dangerous because so deep was the conspiracy and so great and unclean was the wealth—all this is only too well known and need not be repeated. It is of far greater consequence to retrace to its source, as the author does in his introduction, the aversion against the Jew and thence the progress of the ill will and the repressive measures until the Jew is finally driven out as an unbearable evil to the society in which he has but been endured. The author here distinguishes between the two leading principles in the legislation against the Jew:

1. The principle inherited from Christian Rome, where the Jew is looked upon as a non-believer, hostile to the ruling religion, and

against whose influence the state must be protected. This principle penetrates to the Germanic empires founded upon Rome, and finds its strongest manifestation in the laws of the Catholic Church, causing not a little of that suspicious hatred and constant exposure to persecution on account of the faith from which the Jew suffers during the whole mediæval period and down to our days. The antagonism of the ruling church is probably nowhere shown so distinctly as in the novella by Justinian, where the Jew is deprived of civic honor and yet made to contribute to the maintenance of the state (p. 19). The Byzantine Empire is conspicuous for its intolerance. Constantine V., Porphyrogenitos, for example, prescribed as a fitting humiliation for the Jew the following oath, which became the model of similar ceremonies in mediæval court proceedings:

> The Jew shall girdle himself with thorns, hold the roll of the law in his hand, and say: By the Lord, praised be he, the God of our fathers, who created heaven and earth, and brought us to the Land through the Red Sea, I speak true. But should I be found to have lied, may the Lord give me the leprosy of Giezi and Naaman and the curse of the priest Eli, and may the earth open her mouth and swallow me alive as she did Dathan and Abiron.

2. The other equally important principle is based on the view that the Jew, wherever he stays, is a foreigner, and as such he is to be treated as an outlaw, subject to any outrage; a view thoroughly in keeping with the narrow tribal conception of freedom and rights which characterizes primitive society and was inherent in Germanic tribal law. According to this the man of foreign blood whose law and homestead was not known fell a victim to the superior rights of the one who first met him and succeeded in capturing him. The only way for the stranger to escape was to appeal to one still stronger, to the lord of the country, and give himself entirely into his power. The most satisfactory protector was of course the king, into whose power any homeless or lordless man or beast who trespassed upon forest, waterways or highways must ultimately fall, and who would be less likely than any other to seize at once upon the belongings of the stranger or take his life. All the indignities to which the Jews have been subjected are in a large measure due to this view of the stranger as the lawful prey which is so characteristic of a period when the protective power of the state is only in name territorial, while in fact all tribal or provincial law is wholly personal. Thus put between two extremes—the abhorrence of the church for his religion and the

hostility of the tribal law to his nationality—the Jew could only make himself endurable by his capacity for business, which opened up the vista of profit, of economic advantage to the king in return for any help he might accord him. It was a prospect which even persuaded the king to safeguard the Jew against attacks from the church or from popular prejudice, and in return he appropriated the new acquisition for his own particular purposes. At a very early period the Jews were made the slaves of the fisc, their persons and goods to be disposed of at the king's pleasure. As their usefulness depended largely upon their freedom to trade, this freedom was granted them, but they were at the same time made to pay heavily for the privilege. As early as Louis the Pious they were expected to perform certain services to the palace and to contribute yearly in goods and money to the royal treasury (p. 67). In legal procedure they were punished like unfree. But the Jews were intrepid and necessary as peddlers, as traders, intermediaries between the Orient and the Occident. They established themselves at the marts and fairs connected with the royal palaces or the river cities. The slave trade was in their hands. Until the seventh century the Syrians had governed the trade with the West, but for natural reasons the Jews stepped in their place. With wares on their back or treasure concealed on their person they followed, as in the far past the Roman merchant had done, in the wake of the army or the raiding band and reached the inland districts, offering desirable trifles or the far greater treasure of the incomparable arms or the splendid stuffs which the superior skill of the East had manufactured. The Jews succeeded only with indescribable toil in making personal profit out of their bartering, and if any mishap occurred and they sought royal help, the king might seize upon all they had won as his lawful return. They are henceforth most intimately associated with the financial system as the king's bondservants, whose movements he could limit and confine to the place of the original settlement, penned up in some convenient locality, to be sold or transferred as other property, and prevented under penalty and fine from making the least change of domicile. This was particularly the case after their number increased and, the local trade by degrees falling into the hands of natives, they became more and more restricted to the handling of money and lending it on interest. This specialty is the Jews' dire calamity. In an age when ready money was a rarity and the price of it accordingly extraordinary, the obligation to pay beyond

the original amount ended often in the insolvency of the debtor and the Jew taking possession of his goods. The necessity of charging interest, however, was looked upon as a wicked practice which the church forbade. And the claim which the Jew had might not be realized if the king or the prince, upon the presentation of the defaulting party, took upon himself to annul the whole matter. The Jew might be glad if, as the least punishment, he had not to pay heavily in order not to lose all he had.

In the question how the king lived, how he scraped together some income in spite of rapacious vassals and how in an emergency he succeeded in having large sums at his command, the Jew figures as the secret: Open sesame. He was liable to be delivered of large sums at short intervals, often under additional pressure of moral or physical torture; for by natural inclination he often denied that he had anything at all to contribute. Whenever the king's financial condition necessitated it, he was likely to borrow from some trusted Jewish banker with fair promises of repaying, and what he did not get at once he could get after a while by the mere threat of driving the Jew from the country. The best known cases are the forced payments under Richard the Lionheart, John Lackland and the always needy Henry III. (page 90). The sums thus pressed from the despairing Jews surpass even the imagination of their wealth at a time when money was doubly scarce. And yet not even the Christian states or the Christian church in their attempt to put the Jew morally and economically on the rack invented the most oppressive and dangerous mark of their degraded position. It was Islâm, the supposed tolerant Islâm, which decreed that the Jew should be characterized by his clothing and other signs as an unbeliever and an alien (p. 31), and it is from Islâm, Scherer thinks, that the famous council of 1215 under the auspices of Innocent III. borrowed its idea of ordering the same thing for all Christian countries (p. 42) — a demand which singled the Jews out for persecution and made it impossible for them to mingle or even to come to any cordial terms with the population. They were henceforth reduced to the narrow circle which their belief, their character, and their occupation created, without any promise of ever breaking through it. The fury of ignorance which so often characterized the Catholic Church caused the popes repeatedly to order the confiscation of their sacred books, particularly the Talmud, at times when the congregation was worshiping in the synagogue. That the Jew grew desperate and became more unscrupulous

than ever in the pursuit of riches cannot be surprising, taxes and dues growing apace with the politically hopeless situation. Finally, however, the constant admonitions of the popes to the Christian kings to deliver their peoples of this pest bore its belated fruit, and in spite of the piteous pleadings of the Jews, their property and claims being confiscated, they were expelled from England in 1290, from France in 1393, and during the fifteenth century from the remaining European countries except Germany and Italy. In Germany the always bankrupt emperor could not dispense with this faithful financial milchcow, except where it had been granted away with other privileges to princes, prelates and free cities. Aside from occasional outbreaks of fanaticism, the Jews were there left generally undisturbed, their life, however, being no sinecure.

In the part of the book dealing with Austria, which is by all means the longer, the author goes into details that concern chiefly the political status of the Jew. The pro-Habsburg period was rather favorable to the Jews and they contributed materially towards making Vienna a commercial center for southeast Germany. The magnificent waterway of the Danube and the midway position of the city made it an ideal staple market for the products from the East and the West (p. 123). But later the Jews had to yield in their competition with native traders and became bankers. Their real hardships began after the the establishment of the Habsburg dynasty. The terrors of the Black-Death having made the ignorant people believe the Jews were the secret instigators of the plague, they suffered exceedingly from popular fury (p. 369). In a decree of 1544 they were accused of theft, of usury, of possible underhand dealings with the dreaded Turks and were expelled from the country (p. 450); but inasmuch as they had already repeatedly been expelled and had been allowed to stay some years longer, we do not know from what the author says that this decree was really final in its effects.

If, as history seems to show, a Nemesis slowly but surely visits the evils perpetrated upon the perpetrators, the day of reckoning after so great and bitter wrongs must be very heavy indeed. Whatever their faults were, the Jews seem to be more sinned against than sinning. To the student of civilization, they appear to have suffered the fate of those more capable in mind, but deficient in brute force. That they survived is the most extraordinary instance of the power of endurance given a race or a small nation by its superior intellect and moral

earnestness. Baffled in their struggle to secure better conditions by mere industry, they developed a dogged determination born of despair to hold out, a determination such as the lone martyrium of a superior race, peculiar in its ideals, exclusive in its devotion, sometimes reaches. The author gives in his preface an account of his object in publishing his book, namely, that material hitherto unexplored will henceforth facilitate the study of the Jews' legal position in the Austrian-Hungarian countries and will go to show that in spite of local differences legislation is generally uniform, that the laws of one place have influenced those of another, the outcome being in this case a rather low level of human rights. He closes with the opportune wish that this work, being written in the service of humanity and truth, the progressive culture of the twentieth century may at last lead man to be man and brother despite everything.

A. M. WERGELAND.

The Rationale of Fire Rates. By A. F. DEAN. Chicago: J. M. Murphy, 1900. 12mo, pp. xiii + 225.

Fire-Rating as a Science. By the same. Chicago: J. M. Murphy, 1900. 12mo, pp. xii + 216 + ix.

FIRE insurance has been characterized as a magnificent system of guess-work. Only through the combined efforts of insurance men like Mr. Dean can this branch of insurance be rescued from the chaotic state in which its past history is enveloped and raised to the level of scientific methods, if not to the rank of a science. It is hardly profitable in this place to enter upon a discussion of the question, Can fire insurance be made a science? Life insurance is a science; but every man must die; no building must burn.

The two volumes under review constitute important and valuable additions to the literature of fire insurance. Experience and reflection are mingled thoroughly in the vigorous discussion of the wide range of subjects with which the author deals. Both volumes are interesting and abound in illustrations and parallelisms. To be sure there are times when Mr. Dean carries his parallelisms, analogies, and antitheses to the point of doubtful utility, as when, for instance, he compares "bug" with "thug," in the first volume; and in Part I of the second volume he introduces extraneous material, the necessity for which is not always apparent. But these are matters of secondary importance

and should not detract from the intrinsic merits of Mr. Dean's books. Besides, Mr. Dean appears to be actuated by the commendable motive of applying scientific methods to fire insurance; and in his anxiety to do so he has, perhaps, gone too far in the attempt to fit facts of fire insurance into the molds of Spencerian philosophy. The last remark applies chiefly to Part I of the second volume.

The Rationale of Fire Rates is divided into a brief introduction; two parts, designated "Review" and "Deductions," respectively; and an appendix of sample schedules and a sample classification list. The review touches briefly upon important aspects of fire insurance, such as associations, anti-compact and other laws, commissions, agents and brokerage, valued policy laws, co-insurance, classifications, standard rates, etc. Mr. Dean finds "the bone of contention" in tariff associations, whose interests he regards as harmonious with those of the community. They encourage, he says, co-operation, a study of processes and substances, fire-preventing devices and safer construction, better care of property, and a more equitable apportionment of the fire tax. The rating association is a public servant which performs important protective and educational functions. Rating associations lead directly to systematic tariffs, uniform classifications, regulated commissions, etc. Open competition is chance. Fire insurance is not entirely like other business enterprises, and consequently it requires individual treatment at the hands of administrative authorities. Naturally the author protests against existing diversities and antagonisms in the statutes relating to insurance in the various states. In the "international comparison of laws and loss ratios" he finds that the lowest cost prevails where a rigid personal responsibility is attached to the insured; and the next lowest, where the industry has not been hampered by exacting laws. "The business has been profitable where rates are low, and unprofitable where rates are high." The attitude of legislatures toward fire insurance companies is often one of hostility, and statutory interferences have sometimes resulted in higher rates and an increase in moral hazard. This is strikingly illustrated by the valued policy laws, the first of which came in with other Granger legislation in 1874. Were legislators more familiar with Mr. Dean's chapter on the valued-policy law it is not improbable that much less of this species of "legislative lunacy" would manifest itself in the future. Only a few days ago a Wisconsin judge, in which state the first valued-policy law was enacted, sentenced a young man, hith-

erto reputed to be of good character, for burning his printing office in order to secure excessive insurance moneys. This crime would probably never been thought of had not a valued-policy law been in force in this state. Analogous to valued-policy laws are laws prohibiting co-insurance, which prevail in one-fourth of our states. Generally speaking, co-insurance is obligatory in Europe and prohibited in the United States! Mr. Dean also points out the anomaly that the principle of co-insurance has always been applied to marine insurance. The question of agents' commissions is fully discussed. "Two tariffs are essential in fire insurance — the tariff of rates to regulate competition among agents and the tariff of commissions to regulate competition among companies." Associated action of companies is necessary for a correct ordering of rates and commissions. In this the companies are confronted by anti-compact and anti-trust legislation which hampers the development of the necessary associations, and assists in perpetuating the conflict between tariff and non-tariff companies. In fire insurance, within limits, competition means discrimination. The very essence of competition is discrimination. Great mercantile establishments employ expert buyers of fire indemnity who go shopping for rates. "Inducements are offered by which one establishment secures its insurance for thousands of dollars less, at the expense of scores of others out of whose treasures the deficit is made good. Three methods of compensating agents are discussed: straight, graded, and contingent commissions. The last method gives the agent a direct financial interest in the profits of the company in his district, and to that extent also toward the building up of the business; but, on the other hand, it may lead to discrimination among the companies represented by him, on part of the agent. The weakness in present commission systems is that "they all estrange agents from the companies and the public, by isolating their interests." Out of every dollar received by the companies in premiums about ninety-eight cents is distributed for expense and fire losses. The former may be analyzed approximately into the following parts: taxes, $0.03; management, $0.15; commissions, $0.20. "Through analytical treatment and legislation based upon reason instead of rancor" a reduction of about one-third in fire cost is possible, as follows: tax reductions, $0.02½; combined inspection, $0.02½; commissions, $0.05; losses, $0.25. Mr. Dean would not reduce inspections absolutely, but combine companies for the purpose of examining risks; and the decrease in losses he

would bring about through a reduction in moral hazard and an equalization of insurance values. He would establish a classification and a standard rate or tariff corresponding to the average of the loss wave, subject to modification by each company on the basis of its experience. In this way each company could still establish its own rates independently. "The final desideratum is uniformity in the requirements of the states, and in the usages of the industry—uniform laws, uniform taxes, uniform financial statements, uniform policy blanks, uniform proportion of insurance to value, uniform classification, uniform rate tariffs that do not discriminate among property owners, and uniform commission tariffs that do not discriminate among agents or property classes."

Fire Rating as a Science follows a similar plan of construction, consisting of an introduction, two parts—"Principles" and "Detail"—and an appendix. Fire underwriters "have allowed the spirit of adventure to elbow the spirit of research into the background." The problem of problems is "to determine the real relation between fire rating and science." Fire insurance is dualistic in its nature: commercial and scientific. These two elements frequently come into conflict because of the compromising attitude of the former. Mr. Dean devotes a good deal of space to a discussion of what science is, and in the chapter following treats of the relativity of knowledge. He emphasizes the establishment of *relations* as the first step in making fire insurance a science. This important fundamental truth the author traces into its far-reaching consequences. A study of relations must inevitably redeem fire insurance from guesswork methods. The law of rhythm is one of a series of laws characterized by philosophers as universal, and subordinate to this law the author places the wave of fire destruction, varying from nothing to the total value of the property. A study of fire wave motion follows, with the conclusion that "waves of fire destruction tend toward reduced width of vibration in proportion as property is segregated into smaller unexposed values." Different classes of property have different waves of fire destruction, but the proportion of the total fire cost borne by different classes has not always been in accordance with their respective wave lines. In this lies an injustice which the establishment of true relations among rates can remedy. A table of individual loss ratios by classes is introduced, showing "the utter worthlessness of the separate experience of a single

company as a criterion to the average loss ratio of each class, while, on the contrary, a comparison of these individual experiences with the column marked 'combined' shows that there is an established mean which, if known, would constitute a reliable standard for determining adequate class rates." Combined classifications would establish *averages* derived from the experience of all; and this is possible, except in case of unusual risks. Hence the companies should adopt uniform classifications, at least for rating purposes, and publish all future local tariffs with the class number opposite each risk. No thoughtful person will question Mr. Dean's statement that we have far less to fear from an honest publicity than from the suspicions generated in the public mind by an ignorance of the facts. Mr. Dean would make all basis tariffs uniform throughout the United States *as to form and method.* He would use this national tariff as a central standard of comparison in bringing about uniformity of analysis and arrangement, and preserving consistent relations among state tariffs to each other. From the standpoint of system he thinks it desirable, perhaps, that the country is divided into states, "representing geographical areas with similar characteristics." The reader gathers somewhat different impressions from p. 137 of Mr. Dean's earlier book: "Fire insurance . . . . is, by its very nature, an interstate industry. Its rates cannot be based upon the experience of single states, and no intelligent treatment of the subject is possible except through either national or interstate action." From the point of view of fire insurance, it is difficult to see that our states necessarily represent "similar characteristics," especially in regard to moral hazard. The reviewer is not at all certain that it cannot be shown that loss wave lines for specific classes of risks, running through the whole country, irrespective of area, are more nearly correct, more just, and more reliable than any state lines which may be formulated. Mr. Dean introduces a large number of tables and diagrams illustrating the relation of losses to premiums, losses to amount at risk, and the average rate, of twenty-two different states. All of these involve much careful labor and are instructive.

When, some time ago, the reviewer examined available fire insurance literature, and in the course of this examination came across the "Universal Schedule," he felt that he had reached an oasis in the desert of fire insurance confusion. He was consequently not a little surprised to have this schedule referred to by Mr. Dean as "an

interesting experiment in the wholesale destruction of fundamental principles and established relations." One of Mr. Dean's objections to the "Universal Schedule" is that it abolishes the autonomy of the states. Will this country ever have a scientific basis of fire rates until this autonomy has been abolished? This and other criticisms of the "Universal Schedule" contained in *Fire Rating as a Sciemce* called forth a reply from Mr. F. C. Moore, president of the Continental and chairman of the committee which edited the "Universal Schedule." All of this controversy, embracing about a dozen contributions, was published in the *Insurance Field* (weekly) for 1901, from March 21 to May 23, inclusive. The reviewer does not consider himself qualified to decide the questions at issue, nor would it be proper to do so; however, he does not hesitate to say that nothing more valuable than this controversy has ever been published touching upon the fundamental principles of fire rates. Mr. Dean's books as well as the "Universal Schedule" should be interpreted in the light of these controversial essays. Both deserve to be studied with care by everyone desirous of learning more about fire insurance, and no one will spend time over them without profiting much thereby.

B. H. MEYER.

UNIVERSITY OF WISCONSIN.

Essai sur la théorie générale de la monnaie. By ALBERT AUPETIT. Paris: Guillaumin et C^ie^, 1901. 8vo, pp. 295.

THIS is a conservative and in the main a careful study of monetary theory. Not much that is new, either in the data of the subject or in its doctrinal aspects, is adduced; though for most readers this judgment will have to rest upon their faith in the author. M. Aupetit makes no claim to any original contribution to the subject other than that which is by very necessity implied in his method of treatment, which consists in the attempt to show how the two distinct lines of investigation — the mathematical and the theoretical-statistical — lead up to identical conclusions. If, therefore, there is nothing new in the non-mathematical part of the book, those of us who are unable to understand the first part and could not, even did the press work in all cases fulfill the primary condition of legibility, are permitted to judge that the same thing is true of the first part, and that the value of the work is in the very establishment of the proposition that the two lines of investigation concur in results. Certainly the conclusions reached

gain in authority if it be indeed true that two really distinct lines of investigation have been followed. Until the mathematical economists are better agreed as to whether they are employing a distinct method of research or rather merely a peculiar manner of exposition, laymen will be entitled to suspend judgment.

In theory M. Aupetit is a bi-metallist, accepting and supporting the usual allied or tributary doctrines. The quantitative or quantity theory — which is it? — is accepted practically without discussion and in naïve disregard of the fact, that in other parts of the world this question is seriously, perhaps even bitterly, in controversy. The book contains well selected, and for the most part, well considered tabulations of statistical material deduced, however, not from the author's own researches but reproduced from the work of acknowledged specialists in statistical investigation. But it is not a little surprising to find that in the discussion of the fall in prices following upon the panic of 1873, M. Aupetit makes no mention of the panic, and attributes the fall entirely to the diminution of coinage material due to the exclusion of silver from the mints.

The work contains neither index nor serviceable table of contents.

H. J. DAVENPORT.

Les banques de dépôt, les banques de credit, et les sociétés financières. By ANDRÉ E. SAYOUS. Paris: L. Larose, 1901. 12mo, pp. 339.

MOST of the French and German economists who have written on banking have chiefly devoted their attention to the various questions connected with the issue of notes, and have said little upon the other aspect of banking so much discussed in the United States — the function of furnishing a deposit currency and of guaranteeing the soundness of property, thus turning it into immediate means of payment. This lacuna, left in foreign banking literature, M. Sayous seeks partially to fill by the present handbook. He has sought to present a clear descriptive account of deposit banks and their functions, including such matters as the technique of foreign exchange, of clearing houses, of stock exchange transactions, and of the issue of securities. The author's arrangement of material is happy. He begins with a brief analysis of the deposit function and compares it with the duties performed by other financial organizations. This is his *introduction*. In

the *première partie*, is included the technical matter already referred to, which forms the *pièce de résistance*. The *seconde partie* closes the volume, and is occupied with a brief survey of a few general problems of banking organization, and with a comparative description of the banking systems of France, Germany, and England.

There are two main points of view from which M. Sayous's work may be considered. It may be regarded as a practical manual for the student of financial affairs, or it may be looked at as, in part, a theoretical study of the mechanism of commerce. It might have been well if the author had confined his attention to one or the other of these two different lines of study, though he could perhaps respond with some force that the limited amount of theory that he gives is necessary for the complete comprehension of the practical portion of the book. As a study of the actual workings of credit institutions, there is little unfavorable criticism of the volume to be offered. The accounts of the various operations studied are clear and seem in general to be correct. They are well arranged and are likely to be serviceable to students, though it would have been an improvement if more reprints of credit documents could have been employed. Such a change would have been more in harmony with the modern mode of dealing with these subjects. As a work of original reference, the book will probably have little value for Americans, since the field is already occupied by several more or less comprehensive studies on the same topic. In French, as the author himself has suggested, the soil he breaks is more nearly virgin; though he seems to be unfamiliar with Arnauné's *La monnaie, le crédit, et le change*, which covers some of the same ground. The present volume may be useful, however, even in this country, as affording a means of comparing our own commercial usages with those of France. This would be still more the case, were it longer.

Criticism of the more theoretical portions of the book must be less favorable. As the title implies, the author recognizes in general three kinds of institutions as coming within the scope of his treatment, the *banques de dépôt*, corresponding generally in their functions to the national and state banks of the United States, the *banques de crédit* by which he refers to a class of institutions corresponding to our loan and trust companies, and the *sociétés financières* which resemble the investment companies of the present day. It is with the different modes of organizing these credit institutions with a view to performing the

transactions set forth in the first part that M. Sayous occupies his later pages. He discriminates with care between the different species of business that may properly be undertaken with the various modes of organization and shows clearly to what operations most attention may safely be given under certain circumstances. Probably the economic student will be more interested in those portions of the discussion that bear on the deposit function than in any others, for the author is clearer and more detailed in his treatment of the deposit than he is elsewhere. He does not offer any original or really fresh matter, but he introduces some discriminations that would prove useful if the form of banking accounts permitted the student always to observe them — as unfortunately it does not, in America. Thus, for example, a valuable discrimination between different classes of deposits according to their origin is laid down as fundamental. Yet, despite this careful classification, there is not always a proper recognition of the real nature of the deposit and its economic purpose. The description of French, German, and English banks offers no salient features. The main criticism upon this part must be its superficiality and lack of freshness.

It may be said of *Les banques de dépôt* that it is a good third-class book — a useful compilation and classification of familiar material. It is one of the books to be tasted, rather than swallowed, or chewed and digested. Unpretentious, M. Sayous's work will disappoint no one and will be convenient and instructive to many.

H. PARKER WILLIS.

Die Vorgänge am Edelmetallmarkte in den Jahren 1870–1873. By DR. MAX J. BONN. Stuttgart: J. G. Cotta'sche Buchhandlung, Nachfolger, 1900. 12mo. pp. 128.

THIS monograph is the fortieth number of the *Münchener Volkswirthschaftliche Studien*, and represents work done by the author in the economic seminar of the University of Munich. The author's object has been that of presenting a somewhat detailed study of the events in the gold and silver market during the years 1870–1873, with a view to ascertaining just which ones exerted a depressing influence on the price of silver. There is a strong controversial tone throughout the book, and the general *motif* seems to be violent opposition to bimetallism.

Dr. Bonn's first effort, before beginning to analyze the events of the years 1870–1873, is to state and criticise the position of the bimetallists on the causes of the decline in the value of silver. Quoting from Arendt and Cernuschi he easily shows that:

> There was, according to this [the bimetallic] doctrine, a time at which the monetary legislation of the more important countries caused a sort of constant and unlimited demand for silver, at a fixed price, and so set a determinate limit to any tendency of silver to decline. When, therefore, the monetary legislation of the controlling nations turned to the side of gold, silver lost . . . . that firm support, that unlimited demand, at a fixed price, furnished by the public mints.

In further elucidation of the bimetallic position, Dr. Bonn points out the universality of the claim that it was primarily the existence of a bimetallic system in France that maintained the parity between gold and silver, at the sacerdotal ratio of 15.5 : 1; and, having thus set forth the classic case for silver, he proceeds to an analysis of the actual conditions. After reviewing the history of the French monetary system from 1803–1870, he concludes that it affords no warrant for the argument of the bimetallists concerning the influence of French demand in maintaining price, but quite the reverse. We may agree with Dr. Bonn's conclusions, as we might with the atomic theory of Lucretius — he is perhaps nearly right, but his means of demonstration are inadequate. There is in this part of his discussion scarcely a trace of reliance upon the original French documents with which this whole argument — so important to the truth or falsity of theoretical bimetallism — must stand or fall. A few references to the report of the German Silver Commission, some quotations from Lexis, and a long abstract from the work of Helfferich — secondary sources, every one, so far as France is concerned — are all he has to offer. Nor is there more weight in his brief for the advocates of the single standard than may be found in a dozen other discussions within the reach of every student. The author is not very satisfactory when he undertakes to discuss the monetary history of the years 1870–1873 and the cause of the fall in the value of silver. He is clear in stating the bimetallic argument in its classical form, and the equally classical reply; but, beyond a few italics and German interjections, he adds no new weight to the side of the controversy he advocates. Here, also, he confines his attention to sound German authorities on his own side and, beyond a passing mention of Laveleye, does not hint at the existence of French or Belgian writers.

Better work is done in the detailed discussion of events in the market for the precious metals, with which the remainder of the work is occupied. There is some rather neat use of statistics showing the movements of the precious metals, and intelligent inferences are drawn regarding the effect of these movements upon the ratio. On the other hand, the author has not neglected the statistics of gold and silver production nor the course of political events nor the effects of legislation; though, naturally, less attention is paid to these latter factors. Some chronological tables, presented by way of easy review of the occurrences of the time, are especially to be commended. While it is probably true that a chronological method of discussing the years in question is far from being ideal, it must be said that in Dr. Bonn's hands the story moves with considerable cumulative effect and leads naturally and convincingly to the conclusion that:

> It was not the abolition of the bimetallic system that first gave the signal for the first decline in the price of silver, four pence, during the years 1870–1873. It was a previous fall in the price, resulting from uncertainty of the silver market, and the fear of an increased supply, that necessitated the abolition of the French double standard.

Throughout the whole treatment, however, there is an absence of references and citations that is trying to the careful reader, and is probably responsible for a number of manifest errors that appear in the statistics and tables. The weakness displayed in the earlier part of the monograph reappears toward the end, where the author, in endeavoring to sum up his conclusions and to apply his results to the bimetallic problem, shows once more a tendency to lean heavily upon a few secondary sources of information.

In general, Dr. Bonn's monograph contributes little of fresh interest to the problem it treats. Some portions of it may be convenient for reference and there are passages that show skill in the handling and presentation of material, but a 'prentice hand is too apparent, and there is often a tendency to write with the shears rather than with the pen. On the whole, *Schwamm darüber!*

H. P. W.

Notes sur le productivisme et le comptabilisme. By ERNEST SOLVAY. Bruxelles: Henri Lamertin, 1900. 8vo, pp. 172.

SEVERAL Belgian economists and sociologists—notably MM. Hector Denis, Ernest Solvay, and Guillaume de Greef—have, at

various times during the last few years, put forth arguments in favor of a plan to which they gave the title "social comptabilism." Of the members of the group, M. Solvay has always seemed to be most completely under the influence of the new idea, and his utterances on the subject have generally indicated a hopeless infatuation. The impression created by his former writings is by no means relieved in this volume of *notes*, a collection of essays,—chiefly reprinted from the *Annales de l'Institut des Sciences Sociales*—of parliamentary speeches, and of various *obiter dicta*. It must be confessed that it has always been open to doubt, just how much of his talk was meant as sober earnest by M. Solvay. But the appearance of this collection, including as it does additional light on the subject of "productivism," may be taken perhaps as a pledge of the author's seriousness, and may entitle his plan to brief analysis and criticism by economists.

But what is "comptabilism?" Put in this cold form, the question might perhaps prove a knock-down blow even for M. Solvay himself, for the topic seems to be enwrapped with so complicated a swaddling of quaint and curious sociological verbiage and terminology that the lay reader has difficulty in disentangling the author's new-born idea. Stated roughly, however, the essential feature of "comptabilism" seems to be a system for making all payments and transfers of values without the use of money. And in this form the notion, far from being new, appears as a discredited old derelict, in America at least, since it is precisely analogous to what has long been known as "mutual banking." Money is to be abolished and in its place is substituted a system of government currency, issued against a pledge of property, synchronous with the transactions for whose consummation it is issued, and easily withdrawn when the need for it has passed. The idea is the same, whether we suppose with the "mutual bankers" that the currency is issued in the form of greenbacks, or with the "comptabilists" that it takes the form of checks drawn upon credits granted to check-book holders and cleared in a government "comptabilist" establishment.

An elaborate criticism of the theory behind this notion would be superfluous. Yet it may be noted how M. Solvay seeks to avoid the rock upon which the "mutual bankers" have always split. The point of difficulty in the "system" is the question: How dispense with a metallic basis; in other words, how get a clear notion of the standard of value, if the precious metals be absolutely discarded? To this

query M. Solvay responds with some very curious reasoning. After all, he says, the value of money is largely conventional. An exchange is merely the transfer of a stamped substance called a coin for another substance that has been put into some form which fits it for everyday use. The respective usefulness or desirability of the two substances determines the proportions in which they exchange. But this usefulness or desirability in the case of money depends upon the fact that it serves a social purpose, by acting as a medium of exchange. Any other substance properly marked, limited in quantity, etc., would have the same value and answer every purpose. Bryan himself could not have spoken more oracularly. But, unlike Bryan, M. Solvay really comes at last to the theoretical point at issue:

> The mathematical fiction . . . . of invariability in the comptabilist unit is legitimate. It is clear that a being of infinite power could at a specified moment of time, fix at any or every place the value of an indefinite number of things whose value varies, expressing such values as functions of the value of some one of these things, taken as unity, and their value so fixed would be constant during a time infinitely short in duration. From the instant when such a unit had been so chosen and employed, though it had had in fact only a momentary existence it would nevertheless remain unchangeable in time and space. It would be the abstract unit of which we have been in search.
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> How should we, for instance, know that silver has fallen in value; that the five-franc piece is not really worth today more than about three francs, if what we call the franc had not retained its original value, thus assuming the character of an absolute standard? Does anyone say that it is known by comparison with the value of gold? But, though the value of gold may be less variable than that of silver, it varies nevertheless. And can anyone believe that, if the gold standard had never existed, we should not be precisely at the same point, so far as concerns perfect knowledge of the actual value of the five-franc piece? To put the question is to answer it in the affirmative, of course: the metal has fallen in value, the unit has not, it is invariable.

Probably this reasoning could not readily be followed by any save a true inflationist. It recalls some of the metaphysical subtleties of the *First Battle*, and criticism may be dispensed with. It is interesting, however, to note the process by which M. Solvay proposes to pass from the "barbarous" system where money is used to a régime of pure "comptabilism." He suggests that the national bank of Belgium be turned into a "comptabilist" institution which shall deliver to individual, corporations, etc., check or account books, which they may

use in drawing upon it, to an amount previously fixed by their hypothecating with the bank goods to the same amount, or leaving with it their own notes guaranteed by some responsible third party. These checks or accounts are then to be offset against one another by the bank, and new books issued to those owning balances after settlement of accounts.

Curious as is the idea of "comptabilism," the concept "productivism" is still more difficult to unravel. It appears to be the pursuit of such a policy on the part of society as will result in keying the productive capacity of every individual up to the highest pitch, by giving to him such training and industrial opportunity as will enable him to make the "best" use of his abilities—an idea reminiscent of the socialist law of distribution, "to each according to his needs." This conception is expressed in the vague "law" laid down by M. Solvay, that "Social progress obeys the principle of satisfying the personal interest of the average social man." Just what the meaning of such a statement might be is perhaps not very clear, though some notion of the practical application of the idea is found in M. Solvay's *Productivist Formula*, where it is set forth that each communal administration should seek to take stock of, guide, and educate such capacities in the inhabitants as will be likely to meet social needs of a universal character. To this end, the departments of public administration should begin to extend their activities, taking charge of natural monopolies, and seeking to afford full scope for abilities in government service. Such a policy would mean equality of opportunity to all.

Further criticism of such a volume is needless. It is little else than a host of familiar economic errors, masquerading in a *soi-disant* scientific guise under a mask of sociologic terms and obscurations.

H. P. W.

Commercial Federation and Colonial Trade Policy. By JOHN DAVIDSON. London: Swan Sonnenschein & Co., 1900. 12mo, pp. 155.

IN this work Professor Davidson discusses the commercial relations of colonies, in especial those of Great Britain, with the mother country. Herein, he thinks, lies the greatest and most permanent of all colonial questions. Other points of interest in connection with colonies—

the matter of self-government, the treatment of natives, the land grant system and so on — have reached a more or less practical conclusion. The commercial question alone remains a problem of the hour.

The author devotes the first two chapters of his book to a review of the historical side of his subject. He traces the development of the mercantile policy, culminating in the complicated restrictions which hampered colonial trade in the eighteenth century, and describes the decline of the system, ending with the abolition of trade regulations and the repeal of the navigation laws. The granting of self-government to the colonies in the middle of the nineteenth century entailed as its logical consequence the permission to them to regulate their own tariffs. This they have proceeded to do with the result that the British Empire, while politically a unit, is separated in a commercial sense into a number of distinct bodies.

The new self-consciousness of the empire which marks the close of the century, and the consequent desire for complete imperial unity is leading to a demand for a readjustment of commercial relations which will bring about a consolidation of all the British dominions into a commercial unit. The proposals made to attain this object, says Professor Davidson, are mainly of two classes, first, the proposition of complete free trade within the whole empire and secondly the proposition of establishing preferential duties within all British dominions as against the rest of the world. The writer admits neither of these suggestions as a practical solution of the question. The first, that of general free trade, he regards as a purely academic idea. The varying economic situations of the colonies, together with the absolute necessity for raising colonial revenue by indirect taxation, put such a proposal quite outside of the field of practical politics. The preferential duties, on the other hand, could never be adopted by the mother country. The colonies might willingly accept such a plan. Indeed Canada, in a tentative way, has already done so in the preferential tariffs (on certain articles) of 1897 and 1899. To England, however, such a course would appear entirely reactionary and contrary to the national policy. Professor Davidson suggests as the best solution of the question the granting of heavy subsidies to freight lines of steamers. This would mean cheap transportation for colonial produce, and would enable the colonies to oust foreign competitors from the British markets. It would also lead to the development of the vast natural resources of the colonies, which would contribute much to the greatness of the empire.

The book contains some further discussion of the special relations of Canada to the empire and the complete estrangement of Canadian sentiment from all idea of annexation to the United States. The work concludes with a chapter, mainly statistical, treating of the extent to which trade may be said to follow the flag.

Professor Davidson has occupied for some ten years past the chair of political economy in the university of New Brunswick, and during this time has devoted much attention to the study of colonial problems and to the economic situation of Canada. He is therefore qualified to speak with a certain amount of authority on the subject of the commercial future of the British colonies.

STEPHEN B. LEACOCK.

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Annuaire de la législation du travail. Publié par l'Office du Travail de Belgique. 3e année, 1899. Bruxelles: J. Leliegue & Cie., 1900. 8vo, pp. xiv + 563.

THE year 1899 was not characterized by much labor legislation of great importance, either in the United States or Europe. Lawmaking in this field was generally limited to perfecting and, in a few cases extending, the great enactments of preceding years. In Germany the workmen's insurance law was amended. In France the employers' liability act was supplemented by ordinance, and in Great Britain the factory laws were variously but not very essentially modified.

In the United States the act of chief moment was the much discussed Colorado law which limited to eight hours the day's work in mines and smelters. Two states (Illinois and Missouri) provided for the establishment of free public employment bureaus. In Belgium an act of considerable significance empowers the executive to issue edicts for securing the health and safety of workmen in all industrial and commercial pursuits, whereas the exercise of this power had been allowed heretofore only in certain occupations legally declared dangerous. It is not without significance, also, that the Russian government has created a "Superior Council for Industry and Mines," charged with the duty of regulating the affairs of mines and workshops as to hours of labor, the hiring of laborers, and other relations of employers and workmen, the health and safety of the work people, etc. These powers are subject, of course, to the oversight of the various ministers of state.

A. P. WINSTON.

Factory People and Their Employers: How Their Relations are made Pleasant and Profitable. A Handbook of practical methods of improving Factory conditions and the Relations of Employer and Employee. By EDWIN L. SHUEY. New York: Lentilhon & Co., 1900. 16mo. pp. x + 224.

THIS excellent little manual is intended to be of service to "thoughtful people—in developing plans" for the improvement of their own communities. Of the three ways by which an employer may share his good fortune with the community, viz., by gifts for educational and philanthropic purposes, by sharing of profits, and by "daily sharing through personal advantages," only the latter is discussed. The arrangement of this is such as to make it an excellent complement to such a book as Gilman's *Dividend to Labor*, where the workings of the different paternal institutions developed by a given employer are described one after the other. Shuey gives typical cases of the employment of one institution after the other, thus making it possible for the reader to secure the information relating to each in the most convenient form.

Chapters I–IV are introductory and deal in a general way with "essential principles" and the conditions to be observed in developing a paternal institution. Chapter V, "How Manufacturer's Interest has been Manifested," deals with typical American cases and forms the body of the book. In it is shown how employers have evinced their interest by improving the plant and by providing baths, lockers, lunch-rooms, etc., for the personal comfort of their employees; by providing opportunities in the way of libraries and night and day classes for mental and moral training; by shortening the hours of labor for women and providing many conveniences for their special comfort; by establishing savings, pension and loan funds, homes for the aged, etc., and by erecting houses and establishing kindergartens, schools, libraries, and playgrounds. Chapter VI shows how the employees have evinced their interest by organizing clubs, literary and musical societies, and relief associations, and by other forms of co-operative effort. Chapters VII and VIII deal in a very summary manner with "Results" and "Opinions." Finally there is added the name and location of eighty-nine firms and corporations mentioned in the text so that those interested in securing details with regard to any special point may know at once where to apply. The index is good.

Because of his intimate and first-hand acquaintance with institutions of the kind described, the author is well equipped for the work undertaken. The book will be recognized as eminently sane by those not imbued with the idea that "class struggle" is a necessity. The author does "not assume that these methods have already solved the labor questions, but holds [that] they are certainly a valuable contribution to the development of those better conditions for which everyone hopes in the near future."

H. A. MILLIS.